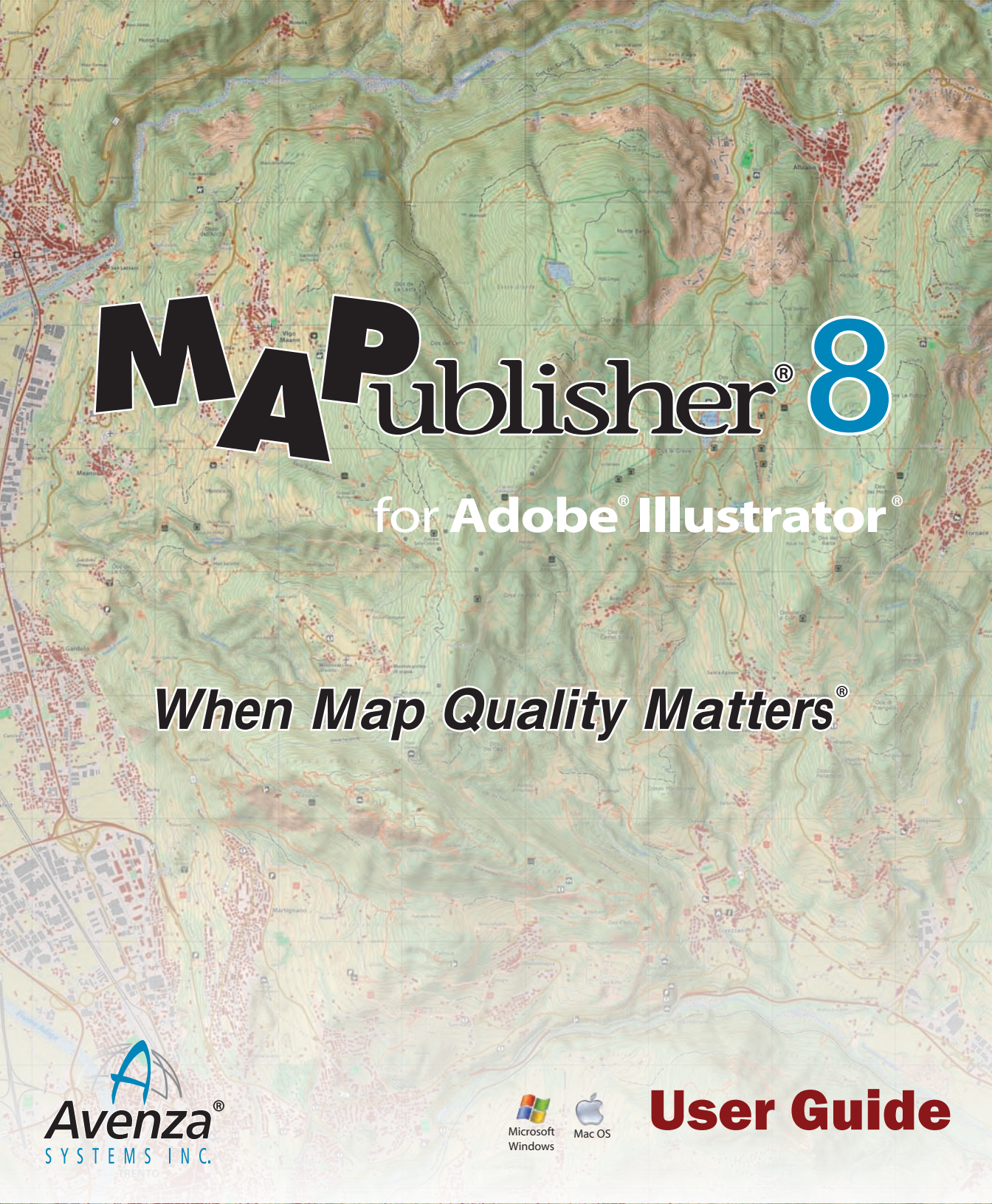

MAPublisher® 8

for Adobe® Illustrator®

When Map Quality Matters®

Avenza® SYSTEMS INC.

Microsoft Windows

Mac OS

User Guide

Avenza MAPublisher 8 User Guide

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MAPublisher® 8 for Adobe® Illustrator® User Guide for Windows and Macintosh.

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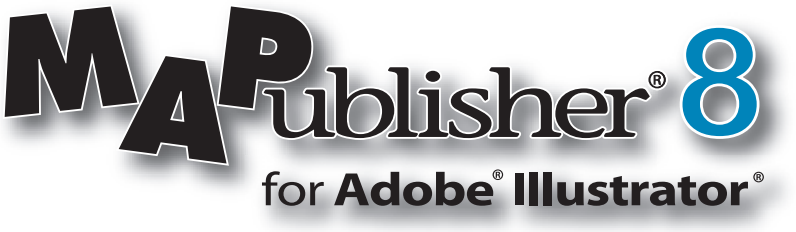

When Map Quality Matters®

User Guide

Welcome

Avenza welcomes you to mapmaking in the 21st century!

Combined with Adobe Illustrator, MAPublisher has revolutionized the art of mapmaking by allowing spatial data files to be used to create maps inside a vector graphics program. MAPublisher allows all your cartographic tasks to be performed where they should be done; in a powerful graphics environment.

This manual assumes that the user is familiar with Adobe Illustrator and has at least a basic understanding of geographic information systems (GIS) terminology and concepts. Please refer to your Adobe Illustrator user guide for more information on using Adobe Illustrator. A glossary of GIS terms is included at the back of this manual.

By following this manual you will learn how to create maps using the MAPublisher filters in Adobe Illustrator. This manual covers the concepts necessary to build a map and perform fundamental cartographic and GIS tasks. A variety of GIS data as well as the MAPublisher 8 tutorial and quick start documents, *MAPublisher 8 Tutorial Guide.pdf* and *MAPublisher 8 Quick Start Guide.pdf*, have been provided on your MAPublisher 8 CD or with your MAPublisher 8 download for use with this guide, however we do encourage you to experiment with your own data to gain additional experience with MAPublisher tools and functions.

Together MAPublisher and Adobe Illustrator will give you a totally integrated cartographic design software system with graphics tools and geographic functions present in the same work environment.

So join first class mapping organizations from around the world and experience modern day map-making by reading this user guide, going through the tutorials and experimenting with MAPublisher 8.

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What's New in MAPublisher 8

MAP Web Author

Use the new MAP Web Author tool to create interactive Flash maps for Web-based content, complete with rollovers, pop-ups and layer control
A number of options are available to design your Web tags:

- Include Images, and set their size.
- Use MAP Attributes to automatically populate the text field.
- Type and style custom text.
- Insert hyper links.

Users can design templates and tag multiple data layers at the time. During the export process, the user can customize the outline of Web tags and see a preview of the final product.

MAP Vector Crop Tool

With MAPublisher 8 new Vector Crop tool, users only need to draw a box around an area of interest and all geometry outside the frame is cropped out, while preserving attributes and styles.

MAPublisher Toolbar

MAPublisher now has its own customizable toolbar. Buttons for importing, all MAPublisher filters, and toggle buttons for MAPublisher panels can be found on this dockable toolbar (Adobe Illustrator CS3 and CS4 only).

New MAP Point Plotter Dialog Box

The MAP Point Plotter dialog box has been redesigned for the release of MAPublisher 8. The point style is now selected from a pop-up dialog box which contains a larger preview of all the styles present in the document, including their full name. By default, the point's position is plotted using the same coordinate system as the current MAP layer, but users can now elect to plot using another coordinate system (geodetic or projected). Another new feature is the ability to plot centroids. A point may now be plotted at the centroid of every area on a selected MAP area layer.

MAPublisher License Management

The new MAPublisher License Management system helps users manage their licensing in a more streamlined and user-friendly manner. Users can now evaluate the product, register, retrieve their licenses and checkout a floating license, all in a single dialog box. Additionally, MAPublisher panels are now marked with a lock icon when the software is not licensed (Adobe Illustrator CS3 and CS4 only).

KML Export for Google Maps

Google Maps does not support the KML Schema tag or any derived tag (i.e. KML files with attributes values). As such, MAPublisher 8 KML export settings now includes an option to export to KML without the attributes information, so that the resultant KML file is compatible with Google Maps.

S-57 Import

IHO S-57 vector format can now be imported with MAPublisher 8. Use the supplied S-57 template to automatically style the map on import.

Geographic Markup Language - Simple Features Import and Export

OGC GML Simple Features (points, lines and polygons), version 2.0 and higher, can now be imported and exported (to version 3.1.1) with MAPublisher 8.

Enhanced MAP Views Editor

The MAP View Editor now has the ability to display both thumbnails and coloured extents of MAP Views in the document. Combined with the new ability to zoom and pan the preview, users should find it much easier to precisely position their MAP view on the canvas.

Enhanced MAP Attributes Interface

The attribute viewer has had several enhancements added for MAPublisher 8. Several buttons have been added to provide faster access to some existing functionality: the column button makes setting attribute visibility much more accessible and the *Zoom to Feature* button zeroes in on the current row's artwork in one click. The look and feel of the panels has also been improved, with new icons for existing buttons as well as new attribute type icons in the column headers. Additionally, the list of layers now only displays MAP layers that have selected MAP features selected.

Improved Simplify Line Functionality

With MAPublisher 8, *Simplify Lines* now preserves topology when simplifying—no more gaps between simplified polygons. In addition, a new preview option lets you see the results without leaving the dialog box—it even displays simplification statistics like *points removed*.

Import Optimization

The import process has been optimized, improving the loading speed by up to 80%.

MAPublisher Panels

The MAP View and MAP Stylesheets panels have been revamped for speed and stability. The panels should also provide better feedback about the states of layers and MAP Views or Stylesheets. One immediate effect is that large files or files with large number of layers and MAP Views open much faster. Additionally, the MAP Views panel has a new *Export* button for easy access, as well as a new *Switch to MAP View* button, which should facilitate the movement of layers between MAP Views.

Getting Started

Before using MAPublisher please read this section to ensure that you have a suitable hardware environment, are familiar with the installation and activation procedures, and adequately prepare your system and workspace to make maps with Adobe Illustrator and MAPublisher 8.

Topics covered in this section:

System Requirements
MAPublisher Compatibility Notes
Installation Instructions
MAPublisher License Management
The MAPublisher Tools
The MAPublisher Toolbar
Preparing the Workspace

System Requirements

Before installing MAPublisher 8, please ensure that you have sufficient system resources, as outlined below:

WINDOWS

- Adobe Illustrator CS2* / CS3/ CS4
- Intel Pentium 4 processor or higher (Dual core recommended)
- Windows XP / Vista
- 1 GB of RAM (2 GB of RAM or higher recommended)
- 300 MB of available hard-disk space

MAC OS X

- Adobe Illustrator CS2* / CS3 / CS4
- PowerPC G5 or above (Intel recommended)
- Mac OS X 10.4 or higher
- 1 GB of RAM (2 GB of RAM or higher recommended)
- 300 MB of available hard-disk space

Floating license use with Adobe Illustrator CS2 on Intel Mac computers is not supported.

** Some features are available when using Adobe Illustrator CS3 and CS4 only*

NOTE: Not all foreign language versions of Adobe Illustrator may be supported. Please contact support@avenza.com for more information.

MAPublisher Compatibility Notes

MAPublisher 8 is compatible with Adobe Illustrator CS2 , CS3 and CS4. Please read the following important compatibility information for use when opening legacy MAPublisher and Adobe Illustrator documents.

BACKWARD COMPATIBILITY

MAPublisher 8 documents are not backwards compatible with previous versions of MAPublisher.

MAPUBLISHER 5 (OR EARLIER) DOCUMENTS

Point Data

MAPublisher introduced new standards on dealing with point data in MAPublisher 6. Pre-MAPublisher 6 documents will have font based points converted to symbols on opening of the document.

MAPUBLISHER 6 (OR EARLIER) DOCUMENTS

Grids and Graticules

Grids and Graticules were redesigned in MAPublisher 7. Please note that grids created in previous versions of MAPublisher (6.x and earlier) will need to be recreated with the new tool if the generation of an index is required.

Legend to Stylesheet Conversion

Legend functionality (Assign Legend Info, Draw Legend etc) was ported into MAP Stylesheets in MAPublisher 7. Legend information held in legacy MAPublisher documents (6.x and earlier) will be converted into stylesheets on document open. Subsequently Graphic Styles (for line and area legends), Character Styles (for text legends) and Symbols (for point legends) will automatically be generated and added to the respective Adobe Illustrator panels.

To qualify for legend conversion, legend art in legacy documents must contain the following properties:

1. Be of a valid art type: i.e. polygon, path, symbol or text
2. Have a legend expression assigned (via Assign Legend Info or Auto Assign Legend Info)
3. Have a target MAP Layer

During the conversion process you will be asked to set additional conversion preferences:

1. Determine if target MAP Layers should be immediately assigned to the applicable stylesheet. Checking this option will immediately apply the new stylesheets to map art on target layers, whereas unchecking this option means the new stylesheets will not be applied on document open, allowing you to manually drag target layers into the applicable stylesheet later. Note auto assignment conversions are slower.
2. Determine if you wish to merge similar converted stylesheets (i.e. stylesheets with a matching feature type and original map layer) into a single stylesheet. Note this option will be disabled if it is not applicable.

Tables

Table information held on table layers (i.e. MPTables layers) will be removed on document open. Therefore ensure that all tables have been joined to the vector art prior to opening the document in MAPublisher 8.

ALL MAPUBLISHER DOCUMENTS IN ADOBE ILLUSTRATOR 10 (OR EARLIER) FORMAT

Legacy Text Conversion

Adobe introduced new methods on dealing with text art in Adobe Illustrator CS. Therefore files containing MAPublisher text objects must be converted using Adobe Illustrator and MAPublisher text conversion utilities.

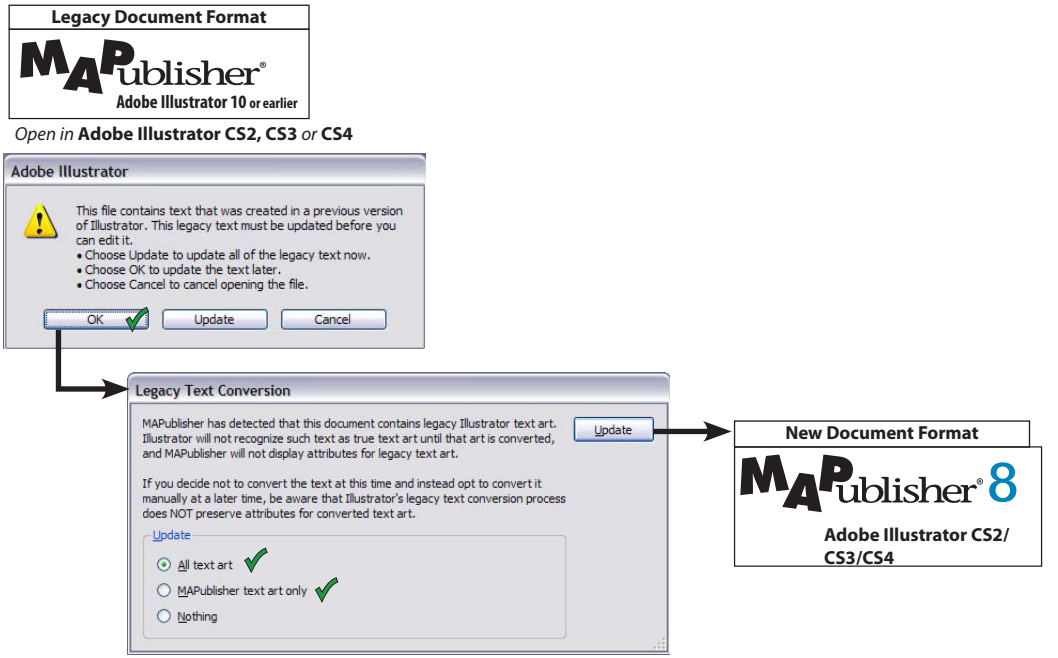
If the **Illustrator Legacy Text Conversion** message appears when opening a legacy document, you should click **OK** *(if the text contains attributes that need to be retained)*. This will allow MAPublisher to use its own conversion utility to update text items maintaining the text attributes. If you click **Update**, the document will be opened, however all attributes associated with this text will be lost.

When receiving the **MAPublisher Legacy Text** message, choose one of the following:

✓ **All text art** to convert both MAPublisher text and regular Adobe Illustrator text to the new Adobe Illustrator text format.

✓ **MAPublisher text art only** to convert only MAPublisher text to the new Adobe Illustrator text format.

✗ **Nothing** to open the file but lose attribute information associated with MAPublisher text elements.


Legacy Document Format
MAPublisher
Adobe Illustrator 10 or earlier
Open in Adobe Illustrator CS2, CS3 or CS4
Adobe Illustrator
This file contains text that was created in a previous version of Illustrator. This legacy text must be updated before you can edit it.
• Choose Update to update all of the legacy text now.
• Choose OK to update the text later.
• Choose Cancel to cancel opening the file.
OK
Update
Cancel
Legacy Text Conversion
MAPublisher has detected that this document contains legacy Illustrator text art. Illustrator will not recognize such text as true text art until that art is converted, and MAPublisher will not display attributes for legacy text art.
If you decide not to convert the text at this time and instead opt to convert it manually at a later time, be aware that Illustrator's legacy text conversion process does NOT preserve attributes for converted text art.
Update
Update
All text art
MAPublisher text art only
Nothing
New Document Format
MAPublisher 8
Adobe Illustrator CS2/ CS3/CS4

Installation Instructions

Please note that MAPublisher is licensed for use on a single computer and once activated will be node-locked to that computer and will only function on that computer. Therefore, before proceeding with installation and activation please ensure that you are installing MAPublisher on the computer upon which you intend to use it.

WINDOWS

1. Make sure that you have a compatible version of Adobe Illustrator installed on your computer. If Adobe Illustrator is running, exit the program.

2. **CD version:** Insert the MAPublisher 8 CD into your CD-ROM drive. If Autorun is disabled on your system, navigate to the *MAPublisher 8.0* directory on the CD, and double-click the **Setup.exe** file.
   Electronic version: Double-click the *mp80wi-e.zip* file to open the WinZip self extractor. When you have unzipped the files proceed to the *MAPublisher* directory and double-click the **Setup.exe** file.

3. Proceed through the installation screens as instructed. You will have options to install documentation and tutorial data. If you choose to install these components these files can be subsequently be found here: *Start > All Programs > Avenza > MAPublisher 8 > MAPublisher Tutorials*.

4. Launch Adobe Illustrator. *Please proceed to the section on Registration and Licensing on the following page.*

MAC OS X

1. Make sure that you have a compatible version of Adobe Illustrator installed on your computer. If Adobe Illustrator is running, exit the program.

2. CD **version:** Insert the MAPublisher 8 CD into your CD-ROM drive. Navigate to the *MAPublisher 8.0* directory on the CD, and double-click the **Install MAPublisher 8.0** icon.
   Electronic version: Unstuff the *mp80mi-e.dmg* file if this operation has not been completed automatically. Then proceed to the *MAPublisher 8.0* folder and double-click the **Install MAPublisher 8.0** icon.

3. Proceed through the installation screens as instructed. Note that documentation and tutorial data will also be installed. After installation, these files can be found in the *Applications\Avenza\MAPublisher 8\MAPublisher Tutorials* . An *Alias* to this folder will be created at the end of the installation process which will be placed on your desktop.

4. Launch Adobe Illustrator. *Please proceed to the section on Registration and Licensing on the following page.*

NOTE: You may install different full version releases (i.e.. 8.x and 7.x) on the same computer if you have two versions of Adobe Illustrator. For example MAPublisher 8 with Adobe Illustrator CS3 and MAPublisher 7.6.3 with Adobe Illustrator CS2. However, you **cannot** have two point-releases of MAPublisher 8.x on the same machine even if you have two different versions of Adobe Illustrator. For example, you cannot operate MAPublisher 8.1 with Adobe Illustrator CS4 and MAPublisher 8 with Adobe Illustrator CS3 on the same computer.

MAPublisher License Management

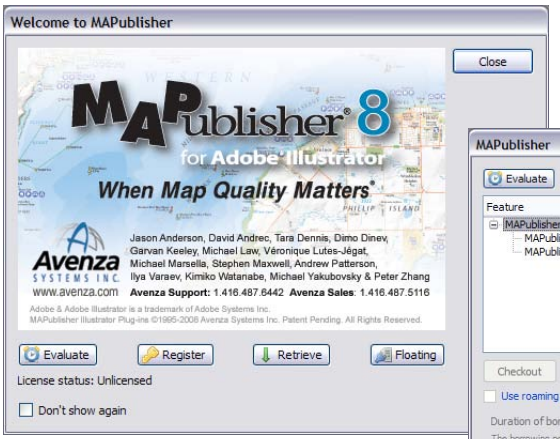
MAPublisher will fail to function until activated. The following instructions are for the activation of single-user licenses of MAPublisher 8 only. If you have purchased a floating license please refer to the floating license installation guide provided with your purchase. MAPublisher 8 is available in both single-user and floating license configurations. Floating licenses are designed to allow an organization to deploy a specific number of licenses that can be used and shared on any number of computers over a network.

IMPORTANT: Some peripheral components might interfere with the activation process. Before activating MAPublisher, users must temporarily unplug or disable: mobile phone, blue tooth, wireless or GPS systems. Laptop users with a docking station must activate MAPublisher in the **undocked** state.

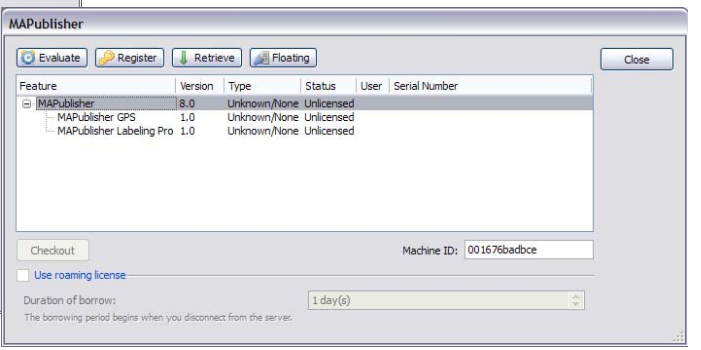
After the installation of MAPublisher 8, launch the version(s) of Adobe Illustrator you installed it to. The *MAPublisher Welcome Screen* will appear automatically. This screen gives four licensing options: **Evaluate, Register, Retrieve** and **Floating**.

NOTE: If you wish to continue to use Adobe Illustrator without MAPublisher, you can cancel this dialog box and activate MAPublisher license later by navigating to the *Help* menu in Adobe Illustrator and then to *MAPublisher Licensing > License Management*.

MAPublisher panels are marked with a lock icon when the software is not licensed (Adobe Illustrator CS3 and CS4 only).


Welcome to MAPublisher
Close
MAPublisher 8
for Adobe Illustrator
When Map Quality Matters
Avenza SYSTEMS INC.
www.avenza.com
Jason Anderson, David Andrec, Tara Dennis, Dimo Dinev, Garvan Keeley, Michael Law, Véronique Lutes-Jégat, Michael Marsella, Stephen Maxwell, Andrew Patterson, Ilya Varaev, Kimiko Watanabe, Michael Yakubovsky & Peter Zhang
Avenza Support: 1.416.487.6442 Avenza Sales: 1.416.487.5116
Evaluate
Register
Retrieve
Floating
License status: Unlicensed
Don't show again

MAPublisher welcome screen



MAPublisher License Management

ACTIVATING AN EVALUATION VERSION OF MAPUBLISHER

1. After installation of MAPublisher 8, click the **Evaluate** button of the **MAPublisher Welcome Screen** or **MAPublisher License Management** dialog box. Fill the form.

   If you cannot activate the evaluation license directly from the application (due to Firewall limitations), then go to *www.avenza.com/register* or email (activation@avenza.com) or phone and provide the Machine ID displayed in the **MAPublisher License Management** dialog box. An email with a zipped license file attachment will be sent to you. You must unzip this attachment and save the *.lic* file to the appropriate folder*.

2. When you are ready to purchase the software you can open the *MAPublisher License Management* dialog box from Adobe Illustrator Help menu at *MAPublisher Licensing* > *License Management*, click **Register** button and follow the instructions in the next paragraph.

REGISTER A PURCHASED COPY OF MAPUBLISHER

1. To activate MAPublisher 8 you must enter the Serial Number which was provided when you purchased the product.
2. After installation of MAPublisher 8, click the **Register** button of the *MAPublisher Welcome Screen* or *MAPublisher License Management* dialog box.You will be prompted to enter the serial number, then fill out the form.

If you cannot register your purchased license directly from the application (due to Firewall limitations), then go to *www.avenza.com/register* or email (activation@avenza.com) or phone and provide the Machine ID displayed in the Finish screen. We will then send you an email with a zipped license file attachment. You must unzip this attachment and save the *.lic* file to the appropriate folder*.

RETRIEVE YOUR MAPUBLISHER LICENSE

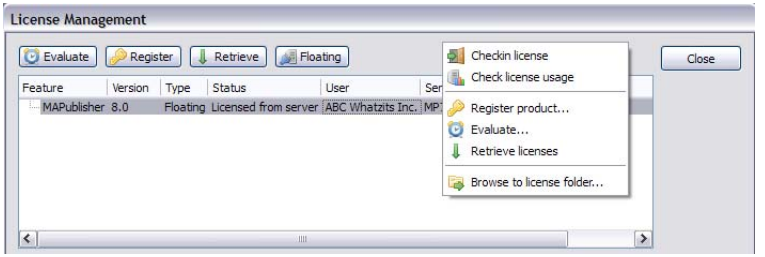
If you have inadvertently deleted your license file from your hard drive, you can click the **Retrieve** button of the *MAPublisher Welcome Screen* or *MAPublisher License Management* dialog box. This will download the license file from our server.

If you cannot retrieve your MAPublisher license directly from the application (due to Firewall limitations), then go to www.avenza.com/register or email (activation@avenza.com) or phone and provide the Machine ID displayed in the Finish screen. We will then send you an email with a zipped license file attachment. You must unzip this attachment and save the *.lic* file to the appropriate folder*.

* The license file is located in the following directories:

Windows XP: *C:\Documents and Settings\All Users\Application Data\Avenza\MAPublisher 8*
Windows Vista: *C:\ProgramData\Avenza\MAPublisher 8*
Mac OS X: *Applications/Avenza/MAPublisher 8/MAPublisher Plug-In*

Alternatively, users may right-click on a row in the **License Management** dialog box (started from the menu *Help* > *MAPublisher Licensing* > *License Management*) and click on the menu item **Browse to license folder...** This opens a file browser at the dedicated MAPublisher license file directory for your operating system. Keeping this browser opened, users can past in the license file received directly at the appropriate location.



CHECKOUT A FLOATING LICENSE

If you have purchased a floating license please refer to the floating license installation guide provided with your purchase. Once the server license is fully operational, follow these instructions to check-out a license from the client machine (computer running the actual MAPublisher application).

1. After installation of MAPublisher 8, click the **Floating** button of the *MAPublisher Welcome Screen* or *MAPublisher License Management* dialog box.
2. Enter the name or IP address of the server where the license manager resides.
3. Click the **Checkout** button to retrieve the one of the licenses from the server.

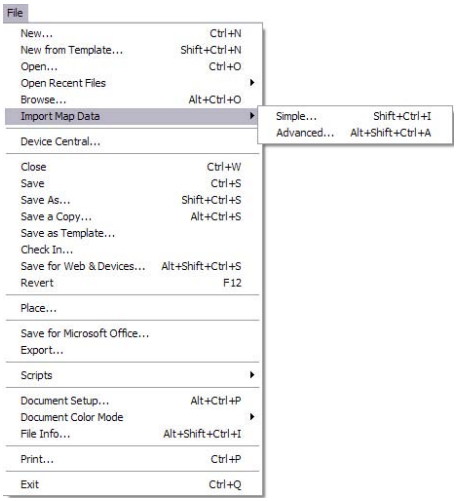
NOTES:

- If you wish to use Adobe Illustrator without MAPublisher, then click the **Check in** button from the MAPublisher License Management dialog box (at *Help* > *MAPublisher Licensing* > *License Management*). This releases the license, so other users can now use it.
- The link to the server is set for once. The next time you start the application, you just need to the click the Checkout button on the MAPublisher Welcome Screen (or License Management dialog box).

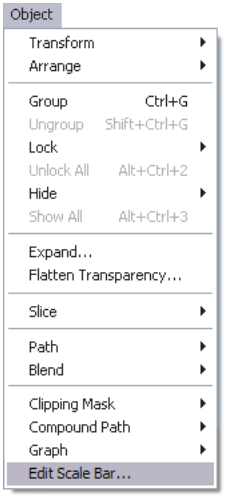
The MAPublisher Tools

MAPublisher tools can be found in a number of locations in Adobe Illustrator.

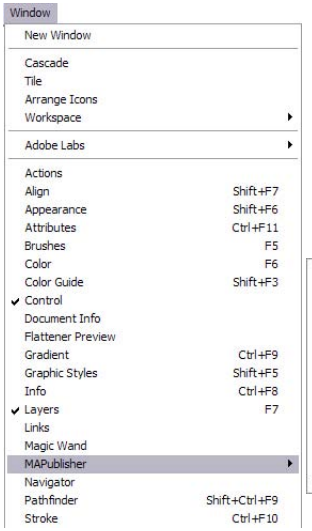
The MAPublisher Importers can be found under the **File** menu and by using the keyboard shortcuts and toolbar.



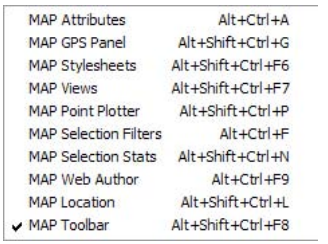
MAPublisher Edit MAP Object* function can be found under the **Object** menu



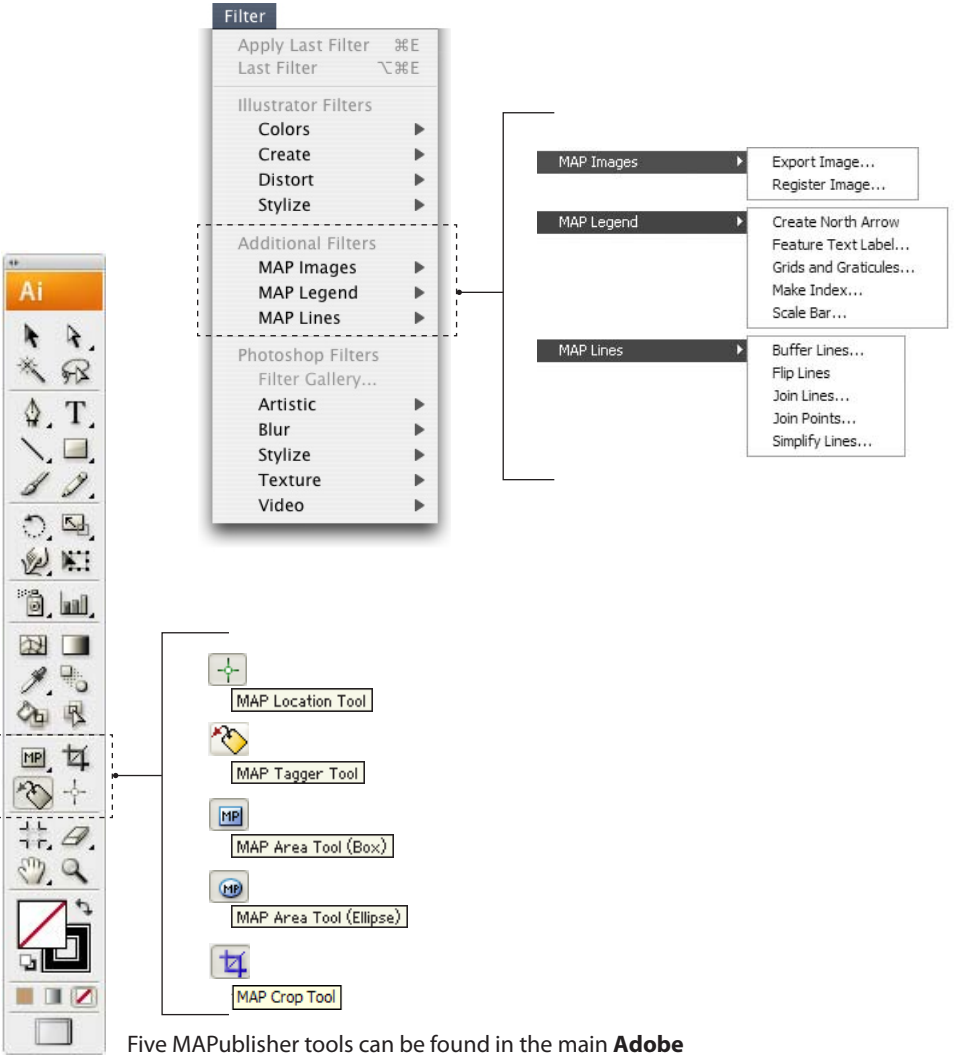
**for editing Scale Bars, Grids and Graticules (menu item name is adjusted accordingly)*



The MAPublisher panels can be found under the **Window** menu



The MAPublisher filters can be found under the **Filter** menu*



Five MAPublisher tools can be found in the main **Adobe Illustrator Tools** panel

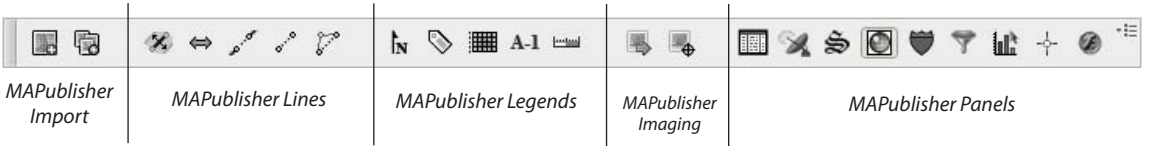
** In Adobe Illustrator CS4, MAPublisher Filters are found in the Object > Filters menu.*

MAPublisher Toolbar

Window > MAPublisher > MAP Toolbar
(Adobe Illustrator CS3 and CS4 only)

The new MAPublisher Toolbar allows the user to launch the MAPublisher tools, described in the previous paragraph, in a single click.

The MAP toolbar is divided in five sections: *MAPublisher Import, MAPublisher Lines, MAPublisher Legends, MAPublisher Imaging, MAPublisher Panels.*

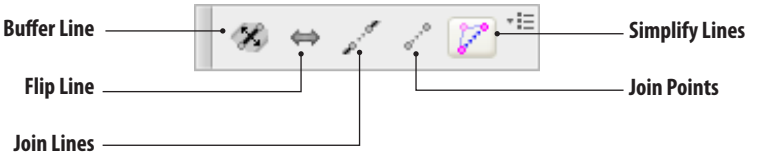


NOTES:

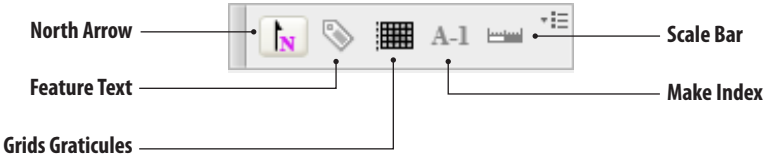
- MAPublisher Toolbar is not available for Adobe Illustrator CS2, only for CS3 and higher versions.
- MAPublisher Toolbar cannot be saved in a workspace (Adobe Illustrator main menu *Window > Workspace >Save Workspace...*)

MAPUBLISHER IMPORT

MAPUBLISHER LINES

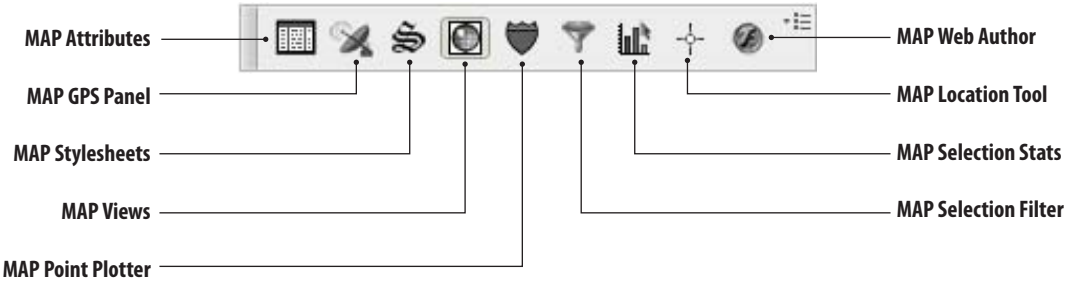


MAPUBLISHER LEGENDS



MAPUBLISHER IMAGING

MAPUBLISHER PANELS



Preparing the Workspace

Before you can start using MAPublisher, you must first set up your Adobe Illustrator document. It is at this point that you define your page size and units, set your print orientation and generally prepare your Adobe Illustrator workspace.

Establish the desired page size and orientation before importing map data as MAPublisher will establish georeferencing based on the current page. However editing page dimensions after import will maintain correct georeferencing based on the new page dimensions.

SETTING UP YOUR DOCUMENT

1. Create a new Adobe Illustrator document by selecting *File > New,* or Select *File > Document Setup* if you already have a blank document open - The Adobe Illustrator Document Setup dialog box appears.

2. Select the size to use for your page. Letter (8.5" x 11") is the default size*. You may wish to change the orientation to landscape for some files. For example, a map of Chile may be best displayed in portrait but a map of Indonesia may be best displayed in landscape.

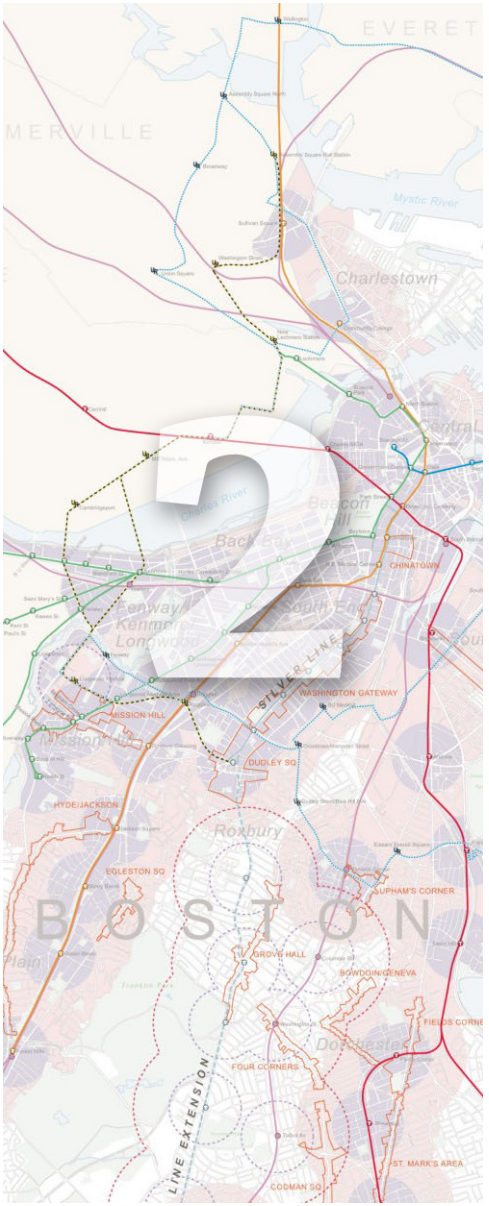
3. Select your desired page units. The default unit type is Points.

4. Ensure the page origin is at 0,0. To do this, select *View > Show Rulers*. Double-click the top left corner of the rulers where the vertical and horizontal rulers intersect.

For more information and details regarding these operations please refer to your Adobe Illustrator User Guide.

** In step 2 the default page size of 8.5" x 11" is for North American versions of Adobe Illustrator. Other language versions of Adobe Illustrator may have different default page sizes. Consult your Adobe Illustrator User Guide for more information.*

NOTE: Due to an Adobe Illustrator limitation, the document size should not exceed a limit of 200 inches by 200 inches (200" equals 5080 mm, 508 cm, 14400 points, 1200 picas, 14400 pixels). Passed this limit, some MAPublisher tools may not operate properly (shift in positioning). Note that the maximum length and width dimension for an Adobe Illustrator document is 227.5416 inches.



Map Data File Formats

MAPublisher 8 will import AND export most of the GIS industry leading vector file formats:

Import Formats
CAD (*.dxf) (*.dwg)
ESRI Interchange File (*.e00)
ESRI ArcInfo Generate (*.gen)
ESRI Shapefile (*.shp)
GML (Simple Features 2.0 +)
MapInfo Interchange (*.mif / *.mid)
MapInfo Table (*.tab)
MicroStation Design (*.dgn) *Not supported under Mac PPC/Rosetta*
Delimited Text Data (*.txt) (*.csv) (*.tsv)
KML (*.kml)
S-57 (*.000)
TIGER/Line (*.rt1) (*.bw1)
USGS Digital Line Graph (*.dlg) (*.opt)
USGS Spatial Data Transfer Standard (SDTS) (*.ddf)

Export Formats
CAD (*.dxf) (*.dwg)
ESRI Interchange File (*.e00)
ESRI ArcInfo Generate (*.gen)
ESRI Shapefile (*.shp)
GML (Simple Features 3.1.1)
MapInfo Interchange (*.mif / *.mid)
MapInfo Table (*.tab)
MicroStation Design (*.dgn)
Delimited Text Data (*.txt) (*.csv) (*.tsv)
KML (*.kml)

This section will provide an overview of the formats outlined above, as well as additional considerations when using GIS data with MAPublisher. For an in-depth analysis of further considerations when using these formats during Import, please see Appendix 1 (pages A1/2 to A1/11).

Import and Export Supported Data Formats

DATA FORMAT DESCRIPTIONS

AutoCAD Drawing (*dwg) and Drawing Exchange (*.dxf)

Import and Export

These file types are most commonly created by Autodesk AutoCAD product, though other software programs such as Bentley MicroStation and various other computer-aided design (CAD) programs are capable of creating files in this format. There are two formats used by AutoCAD: DXF (drawing exchange format) files, which are large, and ASCII representations of the binary DWG (drawing) files. Logically, both files are identical and, therefore, MAPublisher treats both file types in the same manner. AutoCAD files consist of drawing settings and configurations, as well as a series of entities, or graphic elements, organized into layers. MAPublisher provides broad support for many AutoCAD entity types and options. Prior to import set the colour mode of the Adobe Illustrator document to the same scheme used in the colour table of the CAD file (i.e. RGB or CMYK) to ensure colours are imported correctly.
Note the hierarchy of layers in multi-feature imports is by feature type: text layers, then point, then line, then area layers.

ESRI Interchange File (*.e00)

Import and Export

ESRI Interchange File files are created by ESRI ArcInfo product. A single E00 file describes a complete ArcInfo coverage. The file itself is actually an archive of several smaller files, or sub files, which will have fixed names and follow a predefined data format. MAPublisher will reproduce these sub files as distinct Adobe Illustrator layers on import. Therefore importing a single e00 import can result in the generation of point, area, line and text layers.

Note the hierarchy of layers in multi-feature imports is by feature type: text layers, then point, then line, then area layers.

ESRI ArcInfo Generate (*.gen)

Import and Export

ArcInfo Generate files are created by ESRI ArcInfo product, and have a simple ASCII *from x-y to x-y* format. Due to its simplicity you can also use a text editor such as Notepad to create text files and save them with a *.gen extension, which can then be imported with MAPublisher.

ESRI Shapefile (*.shp)

Import and Export

Shapefiles are most commonly created by ESRI ArcView product although other products, including MAPublisher, are capable of generating files in this format. Shapefiles store both geometry and attributes for features, and a single Shapefile will consist of at least three physical files. The .shp portion contains the geometric data, the .dbf contains attributes for the geometric data, and the .shx contains the index information. All three files are required in order to successfully import a Shapefile to Adobe Illustrator using MAPublisher. There is also usually a .prj file, which holds the coordinate system information of the Shapefile and will automatically be read by MAPublisher on import. If your Shapefile folder does not contain a .prj file you will be required to specify the coordinate system in order to fully utilize MAPublisher. The important things to remember when importing Shapefiles are that the .shp file must be the one that is selected through the MAPublisher import filter and that all its component files must be in the same folder. You may also find that your Shapefile directory comes with two extra files, a .sbn and a .sbx, which hold the spatial index for the geometric data. These two files will not exist unless the Shapefile was created with an ESRI product, and are not necessary for successful import with MAPublisher.

GML (Simple Features 2.0+)
Import and Export

The Geographic Markup Language (GML) was designed as a geographic interface language for the Geo-Web. It is currently in draft as an ISO standard (ISO 19136). The goal of the format is to provide users with a set of abstract base objects that can be built into working real world dataset. It uses as XML base to store geometry and feature information that can easily be transported across the Internet.

The *GML Simple Feature Profile* was created by the Open Geospatial Consortium (OGC) as a restricted but useful subset of the GML specification. It provides a reduced geometry and metadata profile that can be shared across many GIS tasks. This simple feature model can be used as a base to generate local application profiles for a specific work area. Since the GML models base abstract classes, these application profiles (schemas) are required for accessing and processing any GML datasets. GML data has a ***.gml** extension, and requires a attributes schema file ***.xsd**. Some GML files may have their .xsd file referenced to a URL path, we recommend to copy the xsd files locally, to avoid error messages upon import when no internet connection is available.

Users have two options to store their .gml and .xsd files: they can be both located in a same directory or the xsd files can be kept in the MAPublisher GML Schema directory found here:
Windows XP and Vista: *C:\Program Files\Avenza\MAPublisher 8\Data Source Files\GMLSchema*
Mac OS X: */Applications/Avenza/MAPublisher 8/MAPublisher Plug-In/Data Source Files/GMLSchema*

The second option is the most practical if all the GML files are using a same schema (only one instance of the xsd file needs to be saved).

Installed with MAPublisher are three default xsd files:

- *xml.xsd,* generic GML attribute schema.
- *nen3610.xsd* and *top10nl.xsd,* models standardized in the Netherlands (maintained by the Dutch topographic office Kadaster).

GML files with a missing xsd file or with an invalid attribute schema will cause a *GML validation error* upon import (see chapter 3). Users have the option to either find the appropriate xsd file and copy it to the GML Schema directory or to the GML file directory, or to disable the GML validation. This option will assign a type string to all attributes. See chapter 3 *Importing Map Data* for more details on these settings.

MAPublisher supports the import of simple features (points, lines, polygons, donuts, and aggregates) in GML 2.0 and later versions. MAPublisher supports export to GML 3.1.1.

MapInfo Interchange (*.mif/*.mid)
Import and Export

Files of this type are most commonly created by the MapInfo product, though other products, including MAPublisher, are also capable of generating files in this format. These files exist in pairs where each file has the same name but ends in either a .mif or .mid file extension. The .mif portion contains the vector geometric data, and the .mid contains the associated attributes. Both files are required in order to successfully import a file of this format to Adobe Illustrator using MAPublisher. The important things to remember when importing MapInfo files are that the .mif file must be the one that is selected through the MAPublisher import filter and that both files must be in the same folder. MAPublisher will automatically locate and deal with the .mid file.

MapInfo Table (*.tab)

Import and Export

The TAB format is a simple, non-topological format for storing the geometric location and attribute information of geographic features, and is an integral part of the MapInfo product. The TAB format defines the geometry and attributes of geographically-referenced features in several files with specific file extensions that are stored in the same folder on disk. They are:

.tab: main file: table structure in ASCII format.
.map: the file that stores the feature geometry.
.id: the file that stores the index of the feature geometry.
.dat: the dBASE file that stores the attribute information of features.
.ind: table field indexes (if necessary)

The geometry of each feature is stored as a shape that comprises a set of vector coordinates. The attributes for each feature are stored as a record in a dBASE table (.dat) associated with the Shapefile (.map). There is one record in the dBASE table for each feature in the map file.

To ensure successful import, select the .tab component in the MAPublisher importers.

MicroStation Design* (*.dgn)

Import and Export

MicroStation Design files (.dgn) are the native files created by Bentley Systems Inc. (and formerly Intergraph) MicroStation product. Design Files consist of a header, followed by a series of elements. The header contains global information including the transformation equation from design units to user coordinates, as well as the dimension of the elements in the file. Each element contains standard display information, such as its colour, level, class, and style, as well as a number of attributes specific to its element type. During the import process MAPublisher will reproduce .dgn levels as distinct Adobe Illustrator layers. Therefore a typical single import will produce one layer for each Level that exists in the MicroStation Design File.

MAPublisher supports the import of MicroStation J (version 7) and V8 files. Files are exported to DGN from MAPublisher as MicroStation J files. Prior to import set the colour mode of the Adobe Illustrator document to the same scheme used in the colour table of the original file (i.e. RGB or CMYK) to ensure that the colours are interpreted correctly upon import.

The hierarchy of layers in multi-feature imports is by feature type in the following order: text layers, then point layers, then line layers, then area layers.

** MicroStation Design file import is not supported under Mac PPC/Rosetta operating system. Please contact Avenza support if you require more assistance regarding this issue.*

Delimited Text Data (*.txt) (*.csv) (*.tsv)

Import and Export

MAPublisher also supports the import of Delimited Text Data held in a variety of tabular file formats, as long as the data contains coordinate values. File types supported are Text (.txt), Tab Separated (.tsv) and Comma Separated (.csv) files. Import Settings dialog box: In order to import point data with MAPublisher you must set parameters by clicking the Settings' button. This operation is required to choose the columns of the selected attribute file that will be used to derive the X and Y coordinates of the data, and ensure correct georeferencing. These and further settings will be discussed in the Delimited Text Data Settings section on page A1/10.

KML (*.kml)

Import and Export

Keyhole Markup Language (KML) is an XML-based language for managing the display of three-dimensional geospatial data in the programs Google Earth, Google Maps, Google Mobile and WorldWind. The KML file specifies a set of features for display. Each feature always has a longitude and a latitude and can have other data, such as tilt, heading, and altitude. KML shares some of the same structural grammar as GML. KML files are very often distributed as KMZ files, which are zipped KML files with a .kmz extension. KMZ files are not supported in this version of MAPublisher.

S-57 (*.000)

Import only

S-57 is referring to the IHO (International Hydrographic Office) Special Publication number 57 related to the *IHO transfer standard for Digital Hydrographic Data* . Maintained by the IHO, S-57 format is intended for the exchange of digital hydrographic data between national hydrographic offices and for its distribution to manufacturers, mariners and other data users. It is used for the supply of ENC cells (Electronic Navigational Charts) to ECDIS (Electronic Chart Display and Information System). The objects spatial geometry can be of Point, Line or Area geometry, while object descriptions are categorized in object classes, organized in specific attributes schemas. To make full use of this format, refer to the online object catalog available on *www.s-57.com*.

MAPublisher imports non-encrypted S-57 data into MAP layers named per S-57 object acronym, of type Area, Line or Points. All S-57 Attributes are converted into MAP Attributes.

An Adobe Illustrator template is supplied to automatically style the map after import. The template contains a series of MAPublisher stylesheets linking S-57 imported features to nautical symbols and graphic styles (libraries provided by Avenza). This representation is non-exhaustive and meant to assist users with limited knowledge of the S-57 format to interpret the data contents more easily. The S-57 template and the symbols and graphic styles libraries can be found in the MAPublisher *Helpful Styles & Symbols* folder (see Appendix 4).

TIGER/Line (*.rt1) (*.bw1)

Import only

TIGER is an abbreviation of T*opologically Integrated Geographic Encoding and Reference System*, and was developed by the U.S. Census Bureau. TIGER/Line files are a digital database of geographic features, such as roads, railroads, rivers, lakes, political boundaries, census statistical boundaries, etc., that cover the entire United States. The database contains information about these features such as their location in latitude and longitude, the name, the type of feature, address ranges for most streets, the geographic relationship to other features, and other related information. TIGER/Line files are the public product created from the Census Bureau TIGER database of geographic formation. TIGER was developed in order to support the mapping and related geographic activities required by the census and sample survey programs. More information on the TIGER/Line file format and data product can be found on the US Census web page at: *http://www.census.gov/geo/www/tiger/*

MAPublisher considers the .rt1 or .bw1 file as the TIGER dataset. Even though each county will consist of a series of files with a common base name, there may be a number of different extensions. Remember to select the .rt1 or .bw1 file when importing TIGER data.

USGS Digital Line Graph (*.dlg) (*.opt)

Import only

The United States Geological Survey DLG file structure is designed to accommodate categories of spatial data represented on a conventional line map. Node (point), line, and area data types are accepted. The attribute coding scheme is designed to accommodate basic cartographic data categories such as hypsography, hydrography, or political and cultural features, as well as additional thematic data categories.

USGS Spatial Data Transfer Standard SDTS (*catd.ddf)

Import only

Digital cartographic products of the USGS are available in the Spatial Data Transfer Standard format, and are generally distributed over the Internet as a means of promoting the standard. For SDTS import, select the *catd* file (xxxxcatd.ddf), which is the index file that contains a description of the other files in the SDTS transfer. Individual DDF files cannot be imported. Generally all SDTS downloads will contain the CATD file.

DATA CONSIDERATIONS

When obtaining GIS data for use with MAPublisher, whether from an online source, commercial vendor, government office or from an internal source within your organization, there are a number of important considerations to keep in mind.

First and foremost you should always endeavour to obtain data in one of the formats supported by the MAPublisher Importers (see above). In cases where the file format native to a particular mapping application is not supported by MAPublisher, you can often request the data provider to export a file in one of the supported formats.

When obtaining data you should acquire as much metadata about the files as possible. MAPublisher deals with data in the following manner: Unprojected data will be imported by MAPublisher with latitude and longitude map anchors, which will therefore range from (x) -180 to 180, (y) -90 to 90.

If you receive projected data you should be aware of the following. MAPublisher will import projected data with a true scale and appropriate map anchors. Unlike unprojected data, these map anchors will not be in lat/long, but rather in a coordinate system appropriate for the particular projection. For most file formats the name of the projection, datum, and units will be recognized by MAPublisher. However if the program cannot find this information in the data, and you wish to subsequently reproject your data, you will be required to specify the coordinate system.

Additionally, please be aware that MAPublisher is a 2D mapping program. Therefore if you attempt to import 3D data with MAPublisher it will be converted to two dimensional artwork by the importers.

NOTE: Data provided in a generic latitude and longitude (unprojected) coordinate system will usually be recognized as a WGS 84 (World Geodetic System 1984 - EPSG = 4326) coordinate system by the MAPublisher importers.

Importing Map Data

The Import filters are the main starting point for most users wanting to work with GIS map data in Adobe Illustrator. These are the filters that must be used to import GIS data files, set the initial map scale and define your cartographic workspace to start making maps.

MAPublisher 8 supports import of the following GIS data formats:
CAD (*.dxf) (*.dwg)
ESRI Interchange File (*.e00)
ESRI ArcInfo Generate (*.gen)
ESRI Shapefile (*.shp)
GML (Simple Features 2.0 +)
MapInfo Interchange (*.mif / *.mid)
MapInfo Table (*.tab)
MicroStation Design (*.dgn) *Not supported under Mac PPC/Rosetta*
Delimited Text Data (*.txt) (*.csv) (*.tsv)
KML (*.kml)
S-57 (*.000)
TIGER/Line (*.rt1) (*.bw1)
USGS Digital Line Graph (*.dlg) (*.opt)
USGS Spatial Data Transfer Standard (SDTS) (*.ddf)
See chapter 2 for a description of these formats.

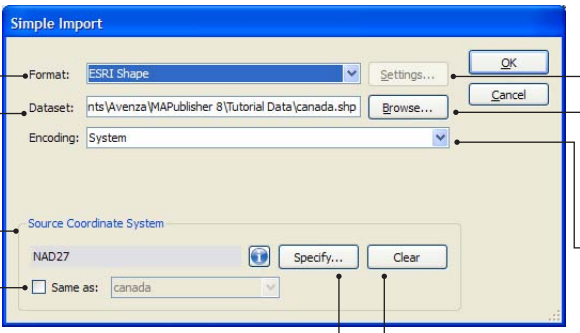
There are two Import filters available, which will be discussed in detail in this section:

Simple Import: This filter is designed to provide a fast way to import one file, or several files of the same data format and coordinate system into Adobe Illustrator.

Advanced Import: This filter provides functionality to import a number of files of differing data type and/or coordinate systems into Adobe Illustrator.

Simple Import

File > Import Map Data > Simple and *MAP Toolbar*



Format - Select the data type you wish to import. This drop-down list shows the names of all MAPublisher supported data types.

Dataset - Displays the directory path and filename for the currently selected file(s). You can also manually type in the dataset location here.

Source Coordinate System - Provides a description of the coordinate system and units detected in the data source.

Same as - Check this option in order to assign a coordinate system that matches that of an existing MAP View.

Specify - If the coordinate system of the selected file(s) is known, but it was not automatically detected by the program, click here. This will open the *Specify Source Coordinate System* dialog box (below).

Clear - Click this button to clear the existing source coordinate system.

Settings - Opens a *Settings* dialog box if the file format requires the input of extra parameters, such as for the import of DGN, DXF, DWG, E00, GML, KML, MIF/MID, Tab and Delimited Text Data (see facing page).

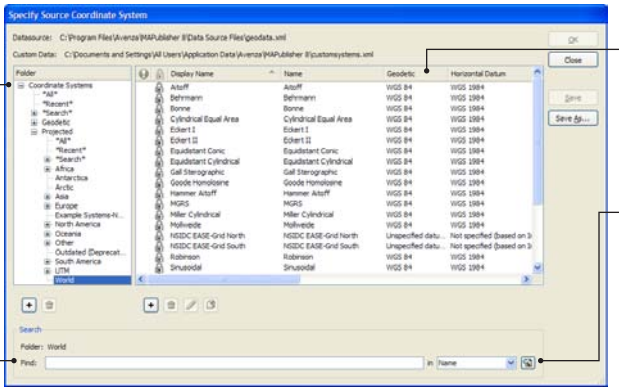
Browse - Opens a Data Source browser to enable the selection of files for import.

Character Encoding - Assign a codec if the attribute information held in the selected dataset uses a double byte character set.

RELATED TOOLS

Specify Source Coordinate System

Accessed via the **Specify** *button.*



Coordinate Systems - Choose a category appropriate to the data to be imported. To view all of the coordinate systems select *All*. For a list of the last 10 coordinate systems used, select *Recent*.

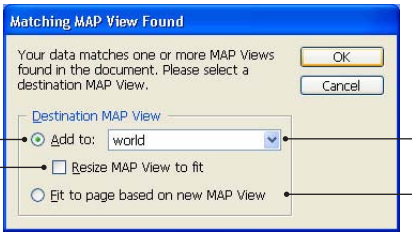
Search - Specify a text string to search the database for coordinate systems. Results are displayed in the *Search* category.

Coordinate System Information - This area shows information about the coordinate systems. (i.e. Name, Type, Envelope, EPSG Code). To choose a known source coordinate system select it from this list.

Search - Click this button and your search results will be populated.

Matching MAP View

Automatically opens if there is already a coordinate system in your document which matches the incoming data.


Matching MAP View Found
Your data matches one or more MAP Views found in the document. Please select a destination MAP View.
OK
Cancel
Destination MAP View
Add to:
world
Resize MAP View to fit
Fit to page based on new MAP View

Add to - Add the incoming data file to a matching MAP View.

Resize MAP View to fit - Check this box to rescale the matching data so that both the selected layer and the incoming data fit inside the page extents.

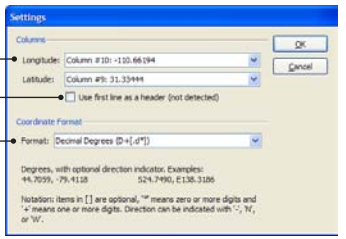
MAP View list - Select the matching coordinate system that you wish to align the incoming data to.

Fit to page based on new MAP View - Both the matching coordinate system and incoming data will be treated separately in terms of page scaling.

IMPORT SETTINGS

Delimited Text Data Settings

Latitude/Longitude or **X/Y Columns** - These two drop-down lists hold the names of all the numeric columns in the selected file. Select the columns from which the coordinates for each point will be read.


Settings
Columns
Longitude:
Column #10: -110.66194
Latitude:
Column #9: 31.33444
Use first line as a header (not detected)
Coordinate Format
Format:
Decimal Degrees (D+[.d*])
Degrees, with optional direction indicator. Examples:
-44.7099, -79.4118
524.7490, E138.3186
Notation: items in [] are optional, '*' means zero or more digits and '+' means one or more digits. Direction can be indicated with '-', 'N', or 'W'.
OK
Cancel

Coordinate Format - This drop-down list allows the format of the data to be set on import (e.g. Decimal Degrees, Packed DMS... see page 77).

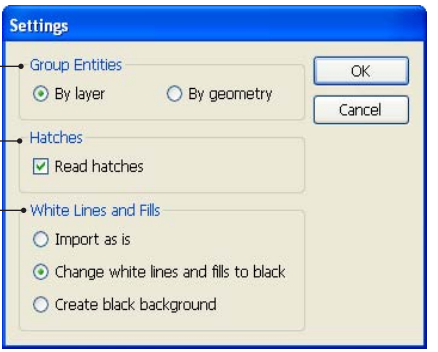
Use first line as a header - If the first line of the text file you are importing contains column headings, check this box.

AutoCAD DXF/DWG Settings

Group Entities By - Group entities by layer name or geometry.

Hatches - Check this box if you want MAPublisher to read your hatch pattern on import .

White Lines and Fills - Choosing the *Import as is* option will instruct MAPublisher to import the data true to the original colour settings contained in the file. Choose the *Change white lines and fills to black* option to import black lines instead of the files native white lines. Choose the *Create black background* option to incorporate a layer containing a black background, to mimic the AutoCAD environment.

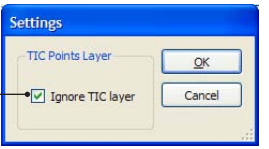


MapInfo TAB and MIF/MID Settings

Pen and Brush Patterns - Enable this box to view the pen and brush pattern values in the imported attribute table.

ESRI Interchange File Settings

Enable - Specify if you require the creation of a layer holding the registration control points. If you enable the *_tic_point* layer won't be created.

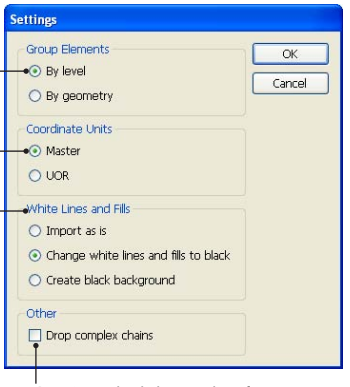


MicroStation Design Settings*

Group Elements - Choose how you want to group the elements. If you group the elements by level, it may result in a large number of output files.

Coordinate Units - Specifies how feature coordinates will be interpreted and converted.

White Lines and Fills - Choosing the *Import as is* option will instruct MAPublisher to import the data true to the original colour settings contained in the file. Choose the *Change white lines and fills to black* option to import black lines instead of the files native white lines. Choose the *Create black background* option to incorporate a layer containing a black background, to mimic the MicroStation environment.



Complex Strings - Check the *Drop* box if you want each component of a complex chain to be returned as its own feature. Otherwise all elements of the complex chain will be merged into a single linear feature.

** MicroStation Design file import is not supported under Mac PPC/Rosetta.*

KML Settings

Allow Random Colour Mode - Checking this box allows Adobe Illustrator to generate random colour settings for your data.

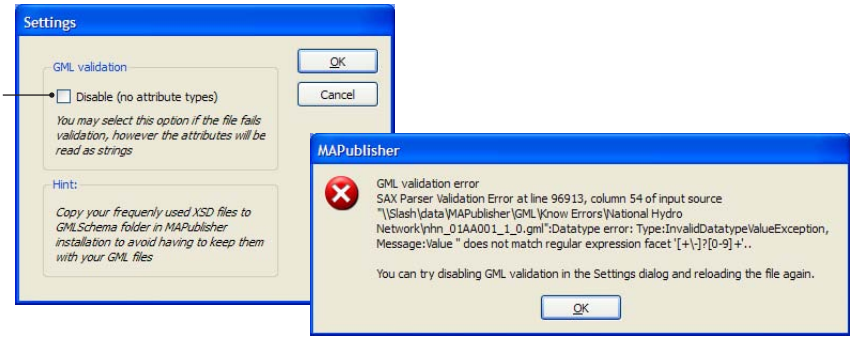
Expand Network Links - Checking this box will enable the use of network linked KML files.

Import KML as Visible Attributes - When this check box is selected the KML-specific attributes will be imported into the attribute table as a visible entities. The KML attributes that will be imported are Description and Address which will display in the MAP Attributes panel as *kmlDescription* and *kmlAddress*. The description column will show the description of each object and the address column will show the corresponding address for that object. When this check box is not selected the attributes will still be imported, however they will not be immediately visible in the MAP Attributes table.

GML (Simple Features 2.0+) Settings

GML validation - GML validation must be disabled to import GML files with a missing .xsd file or with an invalid attribute structure.

If not disabled, a *GML validation error* will be displayed during the import of these files.


Settings
GML validation
Disable (no attribute types)
You may select this option if the file fails validation, however the attributes will be read as strings
Hint:
Copy your frequently used XSD files to GMLSchema folder in MAPublisher installation to avoid having to keep them with your GML files
OK
Cancel
MAPublisher
GML validation error
SAX Parser Validation Error at line 96913, column 54 of input source "\\Slash\data\MAPublisher\GML\Know Errors\National Hydro Network\nhn_01AA001_1_0.gml":Datatype error: Type:InvalidDatatypeValueException, Message:Value '' does not match regular expression facet '[+\-]?[0-9]+'..
You can try disabling GML validation in the Settings dialog and reloading the file again.
OK

SIMPLE IMPORT FUNCTIONALITY

The Simple Import function provides a fast, uncomplicated method of importing map data into Adobe Illustrator. Its purpose is for the map maker who has a single piece of map data, or several smaller files comprising one dataset of the same format and coordinate system, that they wish to import quickly.

PREREQUISITES

In order to import data via Simple Import, you must first set up your Adobe Illustrator document. Plan for the data that you will subsequently bring in, and set up your Adobe Illustrator document accordingly. For instance, a map of the world would fit well into a page with a Landscape orientation, whereas a map of South America would fit best into a page with a Portrait orientation. Also plan for the output of the map document, if necessary, to ensure that your page dimensions are close to the required size that the document will be printed. It is far easier to set up the page before the map data has been imported, as MAPublisher will interpret these dimensions in the Importer, and calculate a map scale for your document accordingly. If you do edit the size of your document, remember to reset your rulers before opening either Importer in order for MAPublisher to correctly fit the data into the page extents.

Once your page has been set up you can access the MAPublisher Simple Import function under the *File* menu, at the *Import Map Data* pullout or from the MAPublisher toolbar button or by using the keyboard shortcut Shift+Ctrl+i.

USING SIMPLE IMPORT

Overview

The dialog box itself is split into two sections. The upper section allows you to choose a file format, select the file you wish to import, and enter any additional settings that may be required. The lower section will display the coordinate system of the selected file and allow you to specify this manually if the program has not detected a coordinate system.

Adding Files

In order to select a file or files for import you can either leave the **Format** drop-down list as <Auto detect format> or set the drop-down list to the file type you wish to import. If this drop-down list is left as <Auto detect format>, when you search for your GIS file, all supported files will be displayed. It is often easier therefore to set the Format drop-down list at the required format to ease navigation.

When you have chosen the format, click the **Browse** button to select your file(s) and then click **Open**. Alternatively you can type in the full path of the file(s) in the **Dataset** text box.

NOTES:

- The import of multiple of Delimited Text files is not supported.
- Data provided in a generic latitude and longitude (unprojected) coordinate system will usually be recognized as a WGS 84 (World Geodetic System 1984 EPSG = 4326) coordinate system by the MAPublisher importers.

Source Coordinate System

Once the **Dataset** text box has been populated with a valid path, the program will read the file(s) to determine the coordinate system and display this in the **Source Coordinate System** section (see chapter 4 on MAP views).

If the program returns the message *[No Coordinate System Specified]* for the coordinate system, you may click the **Specify** button to specify it (MAPublisher will read the coordinate system automatically if the file format supports projection information). In the **Specify Source Coordinate System** dialog box, coordinate systems are separated into categories to ease the process of choosing a coordinate system. Under the Coordinate System category ***All*** will list all the coordinate systems in the database. For an overview of Geodetic and Projected systems and Datums see appendix A2. If you wish to view the parameters of a certain coordinate system, click the **Info** button.

Character Encoding

Extended and international character sets are supported as attributes on import. To assign a character codec suitable for your selected dataset, choose the appropriate value from the list box.

Format Specific Settings

Certain file formats will offer additional configuration parameters which can be accessed by clicking the **Settings** button. These file formats are **ESRI Interchange File**, **CAD DWG/DXF**, **MicroStation DGN***, **MapInfo MIF/MID**, **MapInfo TAB**, **KML**, **Delimited Text Data**† and **GML**. Select your file(s) first. If the format accepts additional settings the **Settings** button will be enabled. Study the import settings guide (page 33) for an overview of the meanings of these options.

** MicroStation Design file import is not supported under PPC/Rosetta operating system*

† Additional Settings are mandatory only for importing Delimited Text Data.

Delimited Text Data Settings

MAPublisher also allows for the import of delimited text files as point data provided they contain coordinate values. Delimited text import allows the user to import many different formats including: Decimal Degrees, Delimited Degrees Minutes Seconds, Degrees.Minutes, Degrees.MinutesSeconds, Packed DMS with decimals and Packed DMS (see chapter 6, page 77). MAPublisher supports the import of delimited text files that contain any of the following delimiters between data values: comma, return, end-of-line and tab.

To import delimited text data, you must choose the **Columns** to use for your latitude/longitude or X and Y coordinates from the two drop-down lists. Note that only numerical columns will be listed to ease the process of determining the columns to use. If the first line of the text file you are importing contains column headings, check the **Use first line as a header** check box, though MAPublisher will generally automatically detect if this is the case. If the file does not appear to contain column headers, MAPublisher will assign the default headers *Column1, Column2* to the attribute columns on import.

Importing Data

When you have your file(s) selected, and, if necessary, specified the coordinate system and/or extra settings, you can click **OK** to import.

If MAPublisher finds there is a coordinate system already in your document which matches the incoming data, the **Matching MAP View** dialog box will open (see chapter 4 on MAP Views). If this dialog box opens you must choose to either add the incoming data file to a specified MAP View, or create a new MAP View to hold the incoming data.

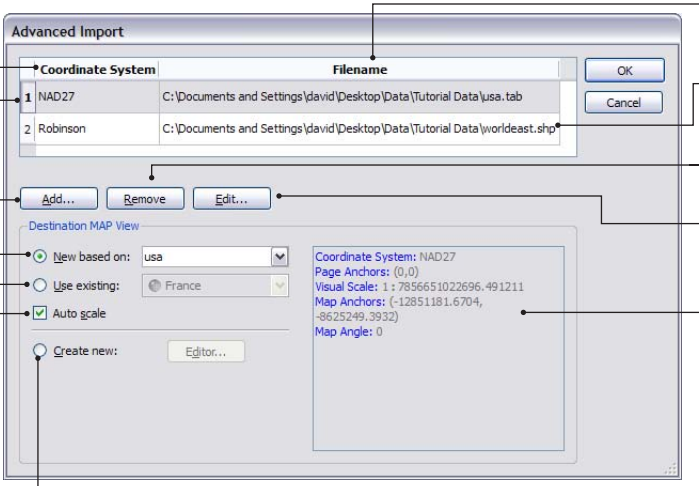
1. If you specify **Add to**, choose the **MAP View** from the drop-down list to add your incoming data to. This option will also allow you to rescale the existing and incoming data which will comprise this MAP View in order to fit them all inside the page extents. To achieve rescaling, check the **Resize MAP View to fit** option. If you do not check this option, some of your data may be imported outside of the page extents.
2. If you specify **Fit to page based on new MAP View**, the incoming data will be treated separately from the matching data, as if it was the first import.

RESULTS

The data will be imported into Adobe Illustrator as individual Adobe Illustrator layers, one for each feature type in the import. The name of these layers will be the same as the name(s) of the original imported data file with the appropriate feature type extension appended. For instance importing a single polygon file named *world.mif* would produce a single Adobe Illustrator layer called *world_area*, which contains the imported file. Additionally this layer can be seen as part of a MAP View, where Adobe Illustrator layers are automatically placed as sub-features of MAP Views (in relation to specific coordinate systems).

Advanced Import

File > *Import Map Data* > *Advanced* and *MAP Toolbar*



Coordinate System- Indicate the coordinate system of the file to be imported.

File Numbers - Allows the selection of individual files in order to activate the Edit and Remove buttons.

Add - Allows the selection of files for import by opening the **Advanced Import Data Source** function (see below).

New based on - Imports all of the files to one of the coordinate systems in the File List.

Use existing - Allows you to import all of the files in a coordinate system that already exists in a MAP View in the document.

Auto scale - If you have multiple files in the File List, and have selected the *New Based On* or *Use Existing* options, check this box to ensure all the files fit inside the page extents when imported.

File Name - The directory path of the map file(s) to be imported

File List - This is a table where all files selected for import are listed.

Remove - Removes selected files from the list.

Edit - Allows the edit of the selected file by re-opening the **Simple Import Data Source** function (see below).

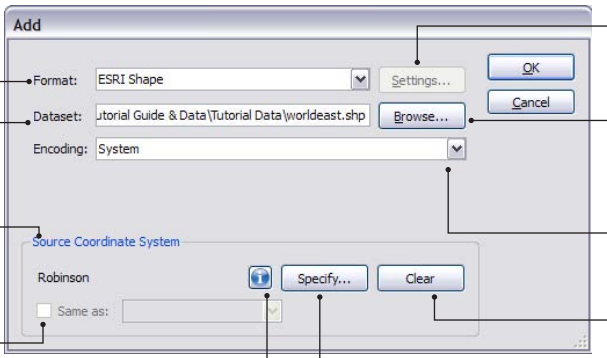
Details - Displays details of currently selected file: Coordinate System, Unit, Page Anchors, Scale, Map Anchors and Rotation.

Create new - Allows you to import all of the files in a new coordinate system. Clicking the **Editor** button opens the **MAP View Editor** (see chapter 4) .

RELATED TOOLS

Advanced Import Data Source

Accessed via the **Add** *or* **Edit** *button.*



Format - Select the data type you wish to import. This drop-down list shows all MAPublisher supported data types.

Dataset - Displays the directory path and filename for the currently selected file(s). You can also manually type in the dataset location here.

Source Coordinate System - This section allows the manual selection of the coordinate system if this information is not held in the data source.

Same as - Check this option in order to assign a coordinate system that matches that of an existing MAP View.

Info - Click this button to view the parameters of a selected coordinate system.

Settings - Opens **Settings** dialog box for file formats that requires the input of extra parameters, such as for the import of DGN, DXF, DWG, E00, GML, KML, MIF/MID, Tab and Delimited Text Data (see chapter 2).

Browse - Opens a Data Source browser to enable the selection of files for import.

Character Encoding - Assign a codec if the attribute information held in the selected dataset uses a double byte character set.

Clear - Click this button to clear the existing parameters of the source coordinate system.

Specify - Click this button to open the **Specify Source Coordinate System** tool (see Appendix 2), enabling you to search for coordinate systems by specifying a text string. Results are displayed in the *Search* category.

IMPORT SETTINGS

See page 33 for the various Import Settings dialog boxes and options.

ADVANCED IMPORT FUNCTIONALITY

Advanced Import provides an alternative method of importing map data into Adobe Illustrator. Its focus is for the map maker who has a collection of map data, that they wish to import into Adobe Illustrator at the same time. This function can deal with import of multiple formats and varying coordinate systems, with the dialog box providing a list of files flagged for import.

PREREQUISITES

In order to import data via Advanced Import, you must first set up your Adobe Illustrator document. Please see the guidelines for setting up your page that are included in the Simple Import *Prerequisites* section (page 34).

Once your page has been set up you can open MAPublisher Advanced Import. This is located under the File menu, at the Import Map Data pullout or from the MAPublisher Toolbar button or by using the keyboard shortcut, Alt+Shift+Ctrl+A.

USING ADVANCED IMPORT

Dialog Box Overview

The dialog box itself is comprised of a list box for the display of currently selected files; buttons to Add, Remove, or Edit files for Import; and a section for the specification of an output coordinate system, whether this be in one of the files in the list, a coordinate system in the current document, or a new user specified coordinate system.

Adding Files

In order to select a file or files for import first click the **Add** button. In the **Add** dialog box *(the same dialog box as Simple Import)* you can either leave the **Format** drop-down list as <Auto detect format> or set the drop-down list to the file type you wish to import. If this drop-down list is left as <Auto detect format>, when you search for your GIS file, all files will be displayed. It is often easier therefore to set the Format drop-down list at the required format to ease navigation.

When you have chosen the format, click the **Browse** button to select your file(s) and then click **Open** (only one file format can be opened from this Open dialog box). Alternatively you can enter the path of the file(s) in the **Dataset** text box.

NOTE: The import of multiple of delimited text files is not supported.

Character Encoding

In MAPublisher 8, double byte characters are supported in attributes on import, allowing such attributes to be used for labelling and export. To assign a codec suitable for your selected dataset, choose a value in the list box.

Source Coordinate System

If you are aware that your selected files do not contain Coordinate System information, you can either specify it within the **Advanced Import Data Source** dialog box, or you can assign a coordinate system based on an existing MAP View in your document by using the **Same As** feature. For an overview of Projections and Datums see appendix A2.

Generally most users should ignore the **Coordinate System** section when choosing the Import files, as the program will read the coordinate system automatically if the file format supports such information. If you wish to view the parameters of a certain coordinate system, click the **Info** button.

Format Specific Settings

Certain file formats will offer additional configuration parameters which can be accessed by clicking the **Settings** button. These file formats are **ESRI Interchange File**, **CAD DWG/DXF**, **MicroStation DGN***, **MapInfo MIF/MID**, **MapInfo TAB**, **KML** and **Delimited Text Data**†. Select your file(s) first. If the format accepts additional settings the Settings button will be enabled. Study the Import Settings guide (page 33) for an overview of the meanings of these options.

** MicroStation Design file import is not supported under Mac PPC/Rosetta operating system.*

† Additional Settings are mandatory only for importing Delimited Text Data.

Delimited Text Data Settings

MAPublisher also allows for the import of delimited text files as point data provided they contain coordinate values. Delimited text import allows the user to import many different formats including: Decimal Degrees, DMS, Degrees. Minutes, Degrees.MinutesSeconds, Delimited DMS, and Packed DMS. MAPublisher supports the import of delimited text files that contain any of the following delimiters between data values: comma, return, end of line and tab.

To import delimited text data, you must choose the **Columns** to use for your X and Y coordinates from the two drop-down lists. Note that only numerical columns will be listed to ease the process of determining the columns to use. If the first line of the text file you are importing contains column headings, check the **Use first line as a header** check box, though MAPublisher will generally automatically detect if this is the case. If the file does not appear to contain column headers, MAPublisher will assign the default headers *Column1, Column2* to the attribute columns on import.

Advanced Import File List

Once the **Dataset** text box has been populated with a valid path and you have clicked OK, the program will close the **Advanced Import Data Source** dialog box and either read the selected file(s) to determine the coordinate system, or attach your specified coordinate system to the files. The file(s) will now be listed in the **Advanced Import** dialog box.

You can now add more files to this list (for instance adding the next file format) by re-clicking the **Add** button and proceeding in the same manner as specified above.

There are two columns present in the Advanced Import list. The first will display the full path of each file, and the second will display the coordinate system that has either been automatically read by the program or assigned manually. Each file added to the Import list will have a row number that can be clicked in order to select it. This function will allow you to remove a selected file from the Import list; or edit a selected file. Therefore to remove a selected file or number of selected files from the Import list click the **Remove** button.

NOTE: The file list cannot contain a mix of known and unknown coordinate systems.

Changing Coordinate Systems Prior to Import

If the program displays **Unknown** for the Coordinate System of a file, you may select the row and click the **Edit** button to specify it by returning you to the **Advanced Import Data Source** dialog box. It is not possible to import multiple files with a mix of unknown and known coordinate systems therefore the unknown coordinate systems will need to be specified.

Note that you can only import the listed files in a single coordinate system, even though they may comprise of several coordinate systems. Therefore the **Destination MAP View** section holds the details of which coordinate system the listed files will be imported in. The destination coordinate system the file(s) will be imported into will be displayed in the panel in this section, and will show the **Name** of the coordinate system, its **Map and Page Anchors**, **Scale** and **Angle** for the selected file. These settings will be discussed more in chapter 5 *MAP Attributes*.

Destination MAP view

You have three choices when deciding the destination coordinate system for the imported files:

1. You can choose to import all of the listed files in the coordinate system and parameters that exists in one of the listed files. Click **New based on** and then select one of the files in the coordinate system you require. If you have multiple files in the *File List,* you can check the **Auto scale** option to ensure that when the data is imported, it is scaled to fit the current page extents. If you do not check this option, your current scale will be used and some of your data may fall outside of the page extents during the import process.
2. Choose to import all of the listed files in the coordinate system and parameters that currently exists in the document (for example via a previous import). In this case select **Use existing** and then select the MAP View containing the desired coordinate system. Check the **Auto scale** option to ensure the combination of incoming and existing data will be fit inside the page extents, i.e. existing data may be rescaled as a result. If you do not check this option, some of your data may be imported outside of the page extents.
3. Choose to assign another coordinate system completely by first selecting the **Create new** option, and then clicking **Editor**. This will open the **MAP View Editor,** allowing you to specify a coordinate system from a projection list and make numerous page scaling edits. For an in depth look at this tool, see chapter 4.

RESULTS

When you have your file(s) selected, and if necessary specified the coordinate system and/or extra settings, you can click **OK** to import. The data will be imported into Adobe Illustrator as individual Adobe Illustrator layers, one for each feature type in the import. The name of these layers will be the same as the name(s) of the original imported data files with the appropriate feature type extension appended. For instance importing a polygon file named *county.mif* and a line file named *roads.shp*, would produce two Adobe Illustrator layers named *county_area* and *roads_line*, which contain the imported files. Additionally these layers will be seen as part of a MAP View, where the Adobe Illustrator layers will be automatically placed as sub features of a single coordinate system, that being the singular coordinate system specified in the *Destination MAP View* section of the *Advanced Import* dialog box.

MAP Views and Georeferencing

The MAP Views panel is the hub from which many additional MAPublisher features may be accessed. The panel itself will display the Adobe Illustrator layers that exist in the current document as sub layers of distinct coordinate systems, or MAP Views. From this tool you can specify coordinate systems for map layers, transform coordinate systems, edit scale and data placement, merge layers, and export to GIS formats.

During a standard Import process, an Adobe Illustrator layer will be created for each feature type automatically, and will be automatically appended with a *_point, _line, _area,* or *_text* suffix in the Adobe Illustrator Layers panel. Certain file types will generate multiple layers, such as the levels found in DGN or DXF, but they will be similarly split up by feature type. A single import of such files will produce a single MAPublisher View as an import can only take place in a single coordinate system. Custom MAP Views may be created in order to georeference existing Adobe Illustrator artwork.

The following pages deal with the creation and management of MAP Views, specifying and reprojecting a coordinate system, editing scale and data placement on the page, merging Adobe Illustrator layers, and exporting to GIS formats.

The topics covered in this section are as follows:

Georeferencing
MAP Views panel
MAP View Editor
Import MAP View
Export
MAP Location Tool

Georeferencing

INTRODUCTION TO GEOREFERENCING

Georeferencing a non-georeferenced Adobe Illustrator file in MAPublisher can be separated into three steps:

1. A **Source Coordinate System** must be specified. The coordinate system gives a method to represent geographic points in relation to a world origin (these are also called point map, geographic, real world or spatial coordinates). Appendix A2 provides details on coordinate systems supported in MAPublisher.
2. MAPublisher bases its georeferencing on a tie point within an Adobe Illustrator document (page). A relationship must be defined between **Page Anchor** and **Map Anchor**.
3. A **Scale** is necessary to translate measurements on the ground to measurements on the page.

During the import process, the software reads the coordinate system settings from the input file and calculates a scale to best fit the map data on the page. The software treats the point at (0,0) in the document (**Page Anchor**) as being coincident to the lower left corner of the data in real world coordinates (**Map Anchor**). From this point on these two points are dynamically linked. MAPublisher uses this anchor point in subsequent data transformations, such as rescaling and transforming, but also in the creation of grids and to maintain georeferencing on export.

If a coordinate system has not been defined in the source data, the **Source Coordinate System** has to be manually set in MAPublisher, as well as the **Scale** (see page 50). One should not estimate this information, it is usually provided as metadata by data vendors or indicated as text on the original map. Also, anchors have to be specified manually (see page 45). **Map Anchor** information must be entered in the coordinate system of the layer. **Page Anchor** are entered in the document units.

The most common way to set up an Adobe Illustrator page is to set the page origin (0,0) to coincide with the lower left corner of the map extents. If this information is not known, you can also use a point on the map for which the geographic location is known (e.g. a building or graticule grids on a scanned map—this information is usually given by the data provider if not obvious on the map itself). You can find page positions of this same point, using the Adobe Illustrator *Information* panel.

Again, once the relationship between the real world coordinates and the page coordinates is established, MAPublisher will be able to perform coordinate system transformations, rescaling, plotting points etc...

NOTE: In MAPublisher dialog boxes, map units are displayed in the coordinate system of the layer. So the **Map Anchor** coordinates must be entered in the **Source Coordinate System** units. For example, the lower left corner of a map might be indicated in latitude/longitude, however the map is projected in WGS84, UTM zone 17N. In that case, the geodetic latitude/longitude coordinates must be converted to ground coordinates in the WGS84, UTM zone 17N system, before they are typed in MAPublisher.

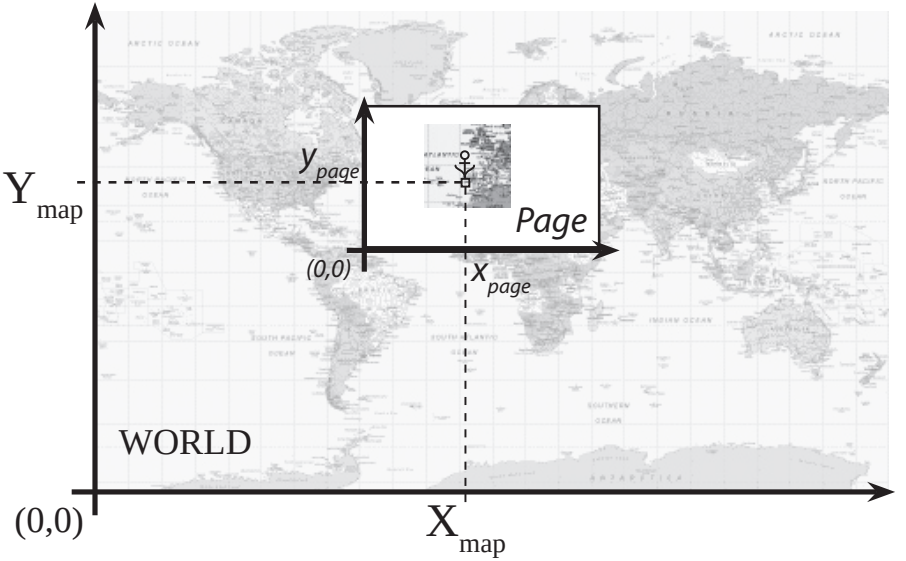
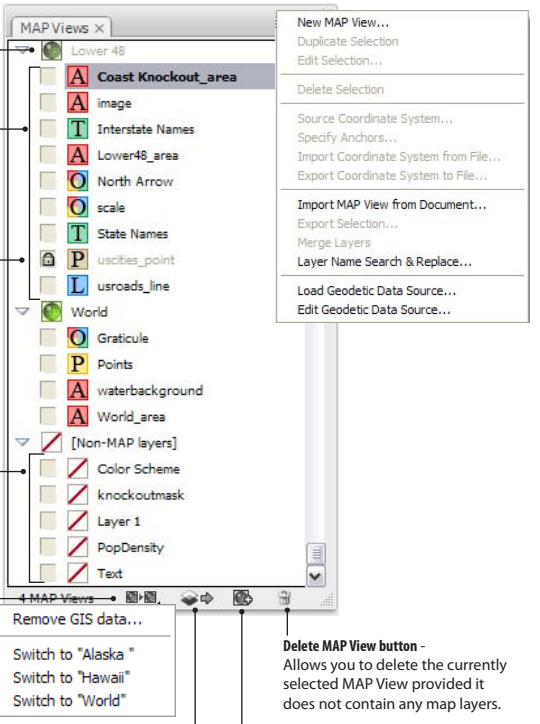


Illustration on page and map anchors

For further information, please refer to the appendices. See appendix A1 page 34, *Georeferencing an Adobe Illustrator file*. Appendix A2 provides general information on projections and gives details of the MAPublisher coordinate systems as well as customizing options.

MAP Views Panel

Window> MAPublisher > MAP Views and *MAP Toolbar*



MAP Views - List of the distinct configurations for geospatial parameters

MAP Layers - An alphabetical list of the layers that comprise each MAP View, symbolized by feature type.

Lock button - Click this box to lock or unlock the Layer (mirrored in the Adobe Illustrator Layers panel).

Non-MAP layers - Lists the Adobe Illustrator layers that are not part of a specified MAP View, and do not contain georeferencing information.

Switch MAP View - Click this button to switch the selected layer from one MAP view to another. *Remove GIS data* moves the selected layer to [Non-MAP layers] section, discarding the geographic information and attributes in the process.

Delete MAP View button - Allows you to delete the currently selected MAP View provided it does not contain any map layers.

New MAP View button - Allows you to create a New MAP View and specify its name and coordinate system information.

Export - Enables the export of the selected MAP View or MAP Layer to various GIS formats.

New MAP View - Allows you to create a new MAP View and specify its name and coordinate information.

Duplicate MAP View - Will create a duplicate of the currently selected MAP View.

Edit MAP View - Allows you to edit the name and coordinate system of the currently selected MAP View.

Delete MAP View - Allows you to delete the currently selected MAP View provided it does not contain any Adobe Illustrator layers.

Source Coordinate System - Allows you to specify the coordinate system of the currently selected MAP View.

Specify Anchors - For manually establishing the tie-in point between Map and Page Anchors (should only be used for new MAP Views or for the correction of georeferencing errors).

Import Coordinate System From File - Imports a coordinate system from different file types including, WKT definitions (*.wkt), MAP files (*.map), ESRI projection files (*.prj), MapInfo TAB files (*.tab).

Export Coordinate System to File - Exports the selected MAP View coordinate system to a WKT definition (*.wkt).

Import MAP View - /mports MAP Views and associated MAP Layers from other open documents, retaining georeferencing and attribute information.

Export - Enables the export of the selected MAP View or MAP Layer to various GIS formats.

Merge Layers - Allows the combining of two or more MAP Layers, as long as their attribute structures match. **Ctrl** key (Windows) or the **Command** key (Mac) select the layers in the MAP Views panel.

Layer Name Search and Replace - To search for text within layer names and specify an alternative. Useful for multi-layer imports.

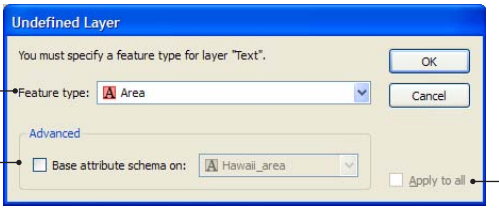
Load Geodetic Datasource - Allows the loading of an external data source in .xml format.

Edit Geodetic Datasource - Allows you to create new coordinate systems and edit the parameters of existing ones in the data source.

RELATED TOOLS

Define Layer

Automatically opens when dragging a Non-MAP layer into a specified MAP View.



Feature Type -Select the type of feature that exists on the layer being dragged. This drop-down list presents a choice of Area, Line, Point, Text or Legend layer types.

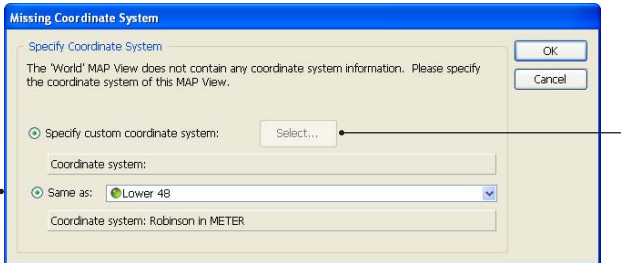
Base Attribute Schema on - Check this option if you wish to copy the attribute schema from an existing MAP Layer. Select the MAP Layer name in the drop-down list to copy it's attribute schema.

Apply to all - If you are dragging a number of layers of the same feature type to a specified MAP View, you should check this box.

Specify Coordinate System

Automatically opens when dragging a MAP Layer to an alternate MAP View, and either the source or destination MAP View has an unspecified coordinate system.

Same as - Choose this option in order to assign a coordinate system to the named MAP View that matches that of an existing MAP View. The coordinate system of the selected MAP View will be displayed below.

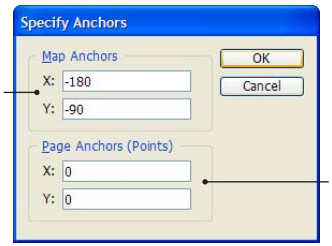

Missing Coordinate System
Specify Coordinate System
The 'World' MAP View does not contain any coordinate system information. Please specify the coordinate system of this MAP View.
OK
Cancel
Specify custom coordinate system:
Select...
Coordinate system:
Same as:
Lower 48
Coordinate system: Robinson in METER

Select custom coordinate system - Choose this option and then click the Select button to specify the coordinate system of the named MAP View via the **Select Coordinate System** dialog box (see Appendix 2). Once selected, the coordinate system will be displayed below it.

Specify Anchors

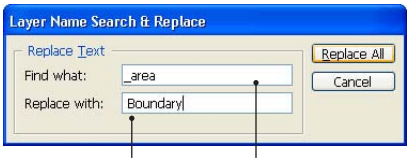
Should only be accessed if you are creating a new MAP View, or you are correcting inaccurate georeferencing information. Caution: editing anchors can damage the accuracy of your data.

Map Anchors - The location of the Map Anchors in the units of the current coordinate system unit.



Page Anchors - The location of the Page Anchors in the units of the current document *(see File > Document Setup)*.

Layer Name Search and Replace



Replace with - Type in the variable you wish to change the layer names to.

Find what - Type in the variable contained in the current layer names on which you wish to search.

OVERVIEW

The MAP Views panel displays a list of all the Adobe Illustrator layers in the current document and each defined configuration for geospatial parameters (coordinate system, anchors, map scale and rotation). Every MAP Layer will be shown in this panel as belonging to a particular MAP View. Adobe Illustrator layers that do not have georeferencing information (e.g. layers existing in the document prior to import) are placed in the [Non-MAP layers] category.

Categories are symbolized in the following manner:

MAP View *layers that contain georeferencing information.*

[Non-MAP layers] *layers that do not contain georeferencing information.*

Each layer that belongs to a MAP View is symbolized in MAPublisher panels and dialog boxes with an icon identifying its feature type:

Area layer *(e.g. county boundaries, urban areas, country outlines etc.)*

Line layer *(e.g. rivers, roads, railways etc.)*

Point layer *(e.g. town and city symbols, railway stations etc.)*

Text layer *(e.g. text labels)*

Legend layer *(for MAPublisher Legend items: North Arrows, Scale Bars, Grids)*

FUNCTIONALITY

MAP Views are designed to provide an easy method of accessing settings for specifying and changing coordinate systems, for editing scale and data placement on the page, and for exporting to GIS formats. Within the MAP Views panel you are just a few clicks away from merging Adobe Illustrator layers, georeferencing existing Adobe Illustrator artwork, changing multiple layer names, and reprojecting data on the fly.

USING THE MAP VIEWS PANEL

Using the **MAP View Editor** will be discussed in detail later in this section.

Reprojecting MAP Layers via MAP Views Panel

The MAP Views panel can be used to move Adobe Illustrator layers from one MAP View to another, enabling you to reproject vector art* quickly. Layers can be moved via drag-and-drop or with the new **Switch MAP View** button .
** Raster imagery cannot be reprojected with MAPublisher.*

For example, if you have two imported data layers, one in UTM projection, and the other in latitude/longitude, MAPublisher will produce two distinct MAP Views, each holding the associated MAP Layer. If you wish to reproject the layer which is in UTM into Lat/Long, drag it from the UTM MAP View and drop it into the Lat/Long MAP View. MAPublisher will automatically reproject the layer to match the destination MAP View.

If you are reprojecting in this manner, and either the origin or destination MAP View does not contain a coordinate system, you will be presented with the **Missing Coordinate System** dialog box after you drag-and-drop. In essence both MAP Views must contain a coordinate system. This dialog box will allow you to specify one of the following:

1. *Specify custom coordinate system* allows you to specify the projection of the named MAP View, via the Source Coordinate System function.
2. *Same as* allows you to specify the coordinate system of the named MAP View by choosing a coordinate system which already exists in a MAP View in your document.

NOTE: Many transformations will inherently cause the loss of precision by the very nature of the complex mathematical calculations that must be performed. Additionally there are differences in precision between MAPublisher and Adobe Illustrator. MAPublisher calculations are in 64-bit for accuracy, but the results still must be stored as 32-bit for Adobe Illustrator. As a result, please be aware that you may lose precision if you drag repeatedly from one coordinate system to another. When determining a coordinate system to use via the drag method, we strongly recommend you use *Edit* > *Undo* to revert coordinate systems until you find the appropriate system for your data.

Layer Name Search and Replace

The MAP Views options list also provides a **Search and Replace** function, enabling the quick change of names of multiple Adobe Illustrator layers. For example MicroStation Design or CAD imports may contain a large number of similar named layers. This option will allow you to quickly change the names of all layers that contain a specified character string.

Merge Layers

This panel also provides a fast way of merging Adobe Illustrator layers. If you have more than one layer in a MAP View that contain the same attribute structure and data type, this option will allow them to be merged into a single layer. For example your data may have been received in pieces, and you therefore find it occupying multiple layers in Adobe Illustrator. Press the Ctrl or Shift keys (Windows) or the **Command** or **Shift** keys (Mac) and click the layers in the MAP Views panel and click the option for **Merge Layers**. The layers will then be merged to provide a single layer holding the data and its associated attributes.

Creating New Layers to Hold Additional Features

In order to plot points, generate text, use legends, or plot grids, scale bars and north arrows, you will first be required to create extra Adobe Illustrator layers to hold this information. This is due to the fact that layers cannot contain more than one feature type. Therefore, prior to generating these additional map features, you need to first create a layer in the Adobe Illustrator layers panel on which these features will be held. Subsequently in the MAP Views panel you should move these layers into the MAP View which contains the coordinate system you require to plot the extra features. The **Feature Type** you should specify for these features in the **Define Layer** dialog box are as follows:

for **Text** items. **Feature Text Label** and **MAP Tagger** (chapter 10) require you have a Text layer for output.

for **Point** symbols. **Point Plot** (see chapter 6) will not function without a Point layer selected.

for **Legend** items. **Grids and Graticules** (see chapter 13), **Scale Bars** and **North Arrows** (see chapter 14) must be placed on Legend layers.

Assigning Georeferencing Information To Adobe Illustrator Layers

Similarly, existing Adobe Illustrator layers that do not contain georeferencing or attribute information will also appear in this panel under the default MAP View entitled **Non-MAP layers**. Such layers can be quickly moved into a specified MAP View with a matching coordinate system. When moving a non-map layer into a specified MAP View you will be prompted by the **Define Layer** dialog box to specify the feature type of the layer you are moving. Multiple layers may be selected and moved together to a specified MAP View. Use the **Apply to all** function in the Define Layer dialog box if the type is identical for all layers to be moved. The Advanced option **Base attribute schema on** allows you to copy the attribute schema from an existing MAP Layer (see chapter 5 for details).

Duplicating And Deleting MAP Views

MAP Views can be duplicated. For example, to make placement or coordinate system edits to certain MAP layers while leaving the others unchanged, drag the MAP layers into the duplicated MAP View, then open the MAP View Editor to make the edits.

Additionally MAP Views that do not contain any MAP layers can be deleted. Both of these tools are accessed in the panel options menu of the MAP Views panel. You can also delete a MAP View by clicking the **Delete** button at the base of the panel. Note that these functions act on MAP Views only, and not MAP Layers.

Creating New MAP Views

To create a new MAP View click **New MAP View** under the panel options menu or click the **New** button at the base of the panel. This will automatically open the **MAP View Editor,** which will be discussed in the MAP View Editor section, allowing you to set up a coordinate system, and enter values for scale, rotation, and page anchors. After you have created a new MAP View, you must use the **Specify Anchors** option from the MAP Views panel to define the tie-in point between Map Anchors and Page Anchors. Note that you must enter Map Anchor values that are indicative of the unit of measurement used in the chosen coordinate system, therefore these values are in Angular or Linear units.

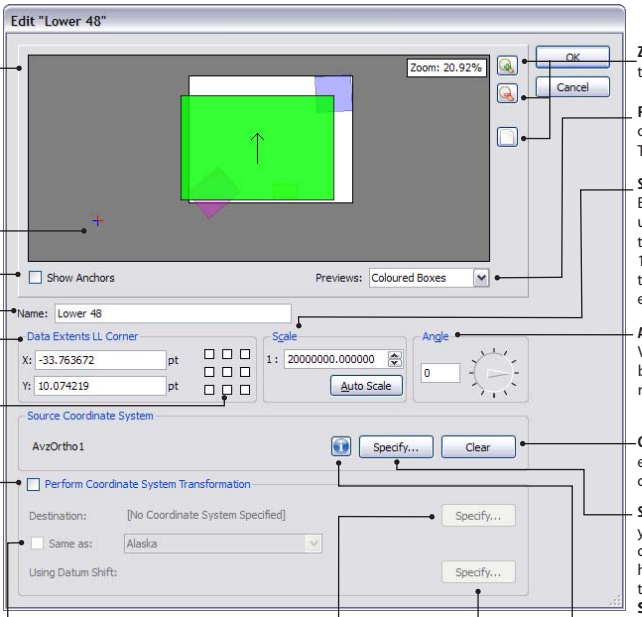
Removing MAPublisher Information

At the end of the project cycle it may be useful to permanently remove all georeferencing and attribute information in the current document. This can now be accomplished by switching your MAP Layer(s) to the [Non-MAP layers] category in the MAP Views panel via **drag and drop** or using the **Switch Map View** button.

NOTE: This function should only be used as a final step as all attributes and georeferencing will be removed leaving a standard Adobe Illustrator file devoid of all map information. Be sure to save a copy of your file before performing this operation.

MAP View Editor

MAP Views panel > Edit MAP View / New MAP View, Advanced Import > Create New > Editor



Preview Pane - Displays the data extents of the MAP View:

White rectangle - Page extents. Green rectangle - Data extents of the current MAP View.

Crosshair - Location of the current Map and Page Anchors.

Show Anchors - Click this box to view or hide the Map Anchors and Page Anchors in the Preview Pane.

Name - The editable name of the current MAP View.

Data Extents LL Corner - Editable location of the lower left corner of the data in document units.

Alignment Control - Click the respective anchor point to set the Page Anchors to a graphically designated location.

Perform Coordinate System Transformation - Check this box to transform your data from your source coordinate system to a selected destination coordinate system

Same as - Check this option to transform to a coordinate system that matches that of an existing MAP View.

Specify Destination Coordinate System - Click this button to open the **Specify Destination Coordinate System** (right), then specify the destination coordinate system for the resulting transformation.

Specify Datum Shift - Click this button to specify a new datum shift

Zoom buttons - zoom in/out or fit to the extents of the map view.

Previews - Select the preview options: None, Coloured Boxes, Thumbnails, Thumbnails and Boxes

Scale - The scale of the MAP View. Edit the scale manually or by using the Up and Down arrows to increase or decrease scale by 10% Click the Auto Scale button to rescale the data to fit the page extents.

Angle - The rotation of the MAP View. Edit the angle manually or by using the clock hand in the rotation control graphic.

Clear - Click this button to clear the existing parameters of the source coordinate system.

Specify Source Coordinate System - If your MAP View does not currently contain a coordinate system, click here to assign one by opening the **Specify Source Coordinate System** tool.

Info - Click this button to view the parameters of a selected coordinate system.

FUNCTIONALITY

The MAP View Editor can be accessed as part of the **Advanced Import** process (chapter 3) or from the **MAP Views** panel. To access via the Advanced Import process, click the **Create new** option in the *Destination MAP View* section, and then click the **Editor** button to open the dialog box. From the **MAP Views** panel select the MAP View you wish to edit, and then select **Edit** under the *Options* arrow in the upper right corner of the panel. Conversely you can double-click the MAP View to open the MAP View Editor.

The MAP View Editor has a variety of purposes. It will allow you to transform coordinate systems, change scale, edit data positioning in the document, change rotation values, and rename MAP Views. Any or all of these functions can be achieved with a single visit to the MAP View Editor. There is also a preview pane where you can see how the edits made to data will affect its extents in the document.

USING THE MAP VIEW EDITOR

Preview Pane

By default, the Preview Pane displays the data extents with a green rectangle and the MAP View orientation with an arrow pointing north. The **Previews** option allows you to change the preview to *None* (default green rectangle), *Coloured boxes* (previews up to 10 MAP views, symbolized with rectangles of different colours), *Thumbnails* (preview

a reduced image of the document contents, including all MAP views) and *Thumbnails and boxes* (shows both thumbnails and coloured boxes of up to 10 MAP views in the document). You can click inside the green rectangle and drag to move the data to a more suitable position within the page. Use the **Zoom In**, **Zoom Out** and **Center** buttons to set the magnification of the preview.

NOTE: Due to Adobe Illustrator rasterization limitation, thumbnails cannot be displayed when a very large MAP View is present in a file.

MAP View Name

The current name of the MAP View is listed in the **Name** text box, which you can edit if desired. Whether the MAP View Editor is accessed via Advanced Import, or from the MAP Views panel, editing the name here will change the name of the resultant or existing MAP View.

Page Anchors

Current page anchors are displayed in the **Data Extents LL** (Lower Left) **Corner X/Y** text boxes, in the current document units. As discussed in the section on georeferencing at the beginning of this chapter, the default page anchors are 0,0 in document units. Editing the page anchor values will move the data relative to the lower left location of the data. Entering negative values will move the data to the left or down, entering positive values will move the data to the right or up. There are also two graphical ways to edit page anchors. Firstly the data can be assigned to respective positions in the document by clicking a respective Alignment Control button, of which there are nine positional options. Conversely dragging the green data preview rectangle around the page in the Preview Pane will update the Page Anchor values accordingly. Note that editing Page Anchors will not affect data integrity. It simply means that the lower left corner of the data in coordinate units (Map Anchors) is located at this new document position.

Scale

The scale of the current MAP View is shown in the **Scale** text box. For MAP Views in projected coordinate system, the scale value is a real world scale (exact ratio *linear distance on the page* over *distance on the ground*). For MAP Views in geodetic coordinate system (i.e. Lat/Long format in angular unit), the scale value is approximated using the common formula 1°= 111.353m (metres per degree at the equator). This is not an accurate number because the formula is only valid at the equator, but it is more intuitive for cartographic considerations.

This text box is editable allowing you to quickly specify an alternate scale. Furthermore the up and down buttons will allow you to fine tune scales by increasing or decreasing a scale by 10% of the starting value. The **Auto Scale** button will allow you to quickly fit the data to the page extents. Clicking this button will edit the scale and page anchors so that it is located in the centre of document.

Transforming a Coordinate System

To transform to another coordinate system in the MAP View Editor the **Perform Coordinate System Transformation** box must be checked. Clicking the **Specify** button in the **Perform Coordinate System Transformation** frame opens the *Specify Destination Coordinate System* dialog box.

In the **Specify Destination Coordinate System** dialog box, coordinate system folders are organized into geodetic and projected systems and then generally according to continents and countries, to ease the process of choosing a coordinate system. When a folder is selected, the list on the right shows the coordinate systems belonging to this

folder. When the ***All *** folder is selected the view lists all of the coordinate systems in the database and if you click this folder, it may take some time to choose the one relevant to your MAP View. The MAP View Editor also offers a check box to enable you to select a coordinate system that already exists in the document. The **Same as** drop-down list will allow you to select from a list of existing georeferenced MAP Views. This function can be used to set all the MAP Views of a document to a same coordinate system, while they keep a different position on the page. Again the **Preview Pane** will display the new data extents for any new coordinate systems specified in the MAP View Editor.

To match coordinate systems across a number of MAP Views, move the Adobe Illustrator layers into the MAP View containing the coordinate system you require, as discussed in the MAP Views panel section. If you wish to view the parameters of a certain coordinate system, click the **Info** button. To edit a coordinate system please refer to appendix A2.

Assigning a Coordinate System

To set the current coordinate system of the data, rather than change coordinate system, you can click the **Specify** button in the Source Coordinate System frame of the MAP View Editor. You must use caution, as this option will set source coordinate systems only, and not serve to reproject your data. Therefore data integrity may be lost if you overwrite the current coordinate system of the MAP View via the use of this utility.

In the **Specify Source Coordinate System** dialog box, coordinate systems are separated into folders to ease the process of choosing a coordinate system. Choose the folder ***All*** to list all the coordinate systems in the database. If the coordinate system needed cannot be found, then enter a text string in the search text box to query the database for coordinate systems. The results are displayed in the *Search* category. For an overview of projections and datums see appendix A2.

Searching For a Coordinate System

The **Specify Source/Destination Coordinate System** dialog box allows you to search for coordinate systems based on an entered text string. Searches can be performed on the whole database, or solely in continent and country sub-folders. To use the *Specify Coordinate System* type a search term into the text box located at the bottom of the dialog box and click the search button.

In the **Find:** text box enter the text on which to search. For example to find coordinate systems with NAD83 properties, enter *NAD83* . Following the **Find:** text box is the **in** text box to select an area of the database in which to search. For example to find NAD83 in the name only, select *Names*.

When you have entered the search criteria, click the *Search* button. If the search has returned results, these results will be displayed in the *Specify Coordinate System* dialog box in the **Search* folder, and can be immediately selected in order to reproject your data or to assign a coordinate system. Search results will be stored in this folder until you restart Adobe Illustrator or perform another *Coordinate System Search*.

NOTE: If you do not find an appropriate coordinate system, you can edit or create a new one in this interface. To do this, please refer to appendix A2.

Rotation

A rotation figure can be applied or edited by specifying an angle in the entry field, or by using the *clock hand* to rotate the MAP View graphically. Notice that changes to rotation will be automatically previewed in the Preview Pane with the green rectangle and arrow depicting the new orientation of the data.

New MAP Views

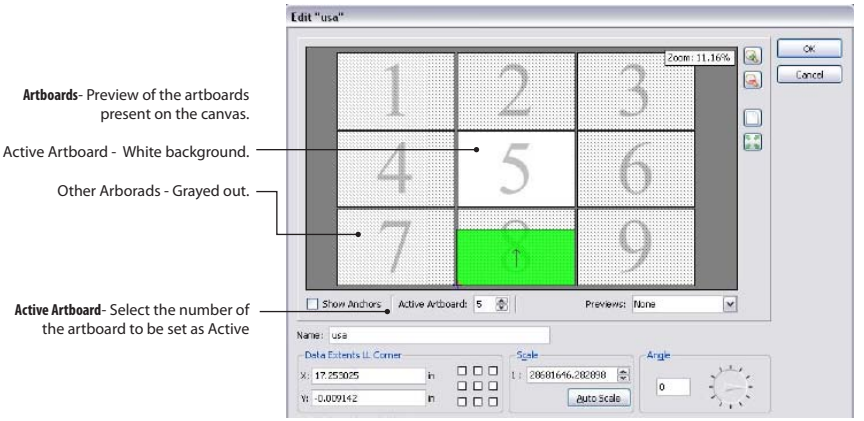
The MAP View Editor is opened by default when creating a **New MAP View**. This will enable you to quickly specify the name, coordinate system and page scaling for your new MAP View. This functionality will be discussed in detail in *Georeferencing an Adobe Illustrator file* on page A1/34. After you have created a new MAP View, you must use the **Specify Anchors** option from the MAP Views panel to define the tie-in point between Map Anchors and Page Anchors (see page 45). Map Anchor values must be entered in units that are indicative of the unit of measurement used in the chosen coordinate system, which may mean that they may not always be in degrees or Lat/Long.

IMPORTANT NOTES FOR ADOBE ILLUSTRATOR CS4 USERS

Adobe Illustrator CS4 introduced the concept of multiple artboards (up to 100). MAPublisher 8 takes this new feature into account in the MAP View Editor.

When using Adobe Illustrator CS4, the MAP View Editor dialog box has an additional drop-down list to select the **Active Artboard**. When this section of the dialog has focus, the **Preview Pane** displays the number of each artboard. The current active artboard is shown in white, while the others are grayed out. The **Data Extents LL Corners** and **Scale** calculations are based on the Active Artboard dimensions.

To move the data extent (green box in the Preview Pane) from one artboard to another, change the Active Artboard number to the artboard where the data is to be moved, then click the Auto Scale button or one of the Data Extents LL Corner boxes.

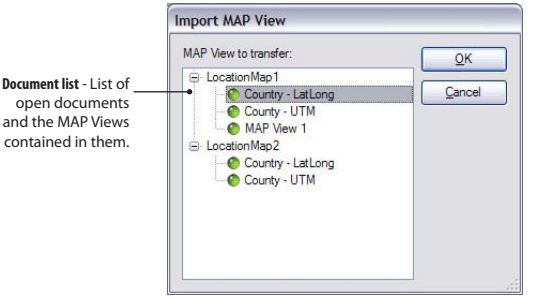


NOTE: Adobe Illustrator CS4 allows users to move artboards. However, this action does not preserve the georeferencing (same effect as moving arts on the active artboard). Instead of moving the artboard, users must do the following:

- Create a new artboard at the desired position on the canvas.
- Open the MAP View Editor and move the data from the initial artboard to the new one (see explanation above).
- Delete the initial artboard.

Import MAP View

MAP Views panel > Import MAP View From Document



FUNCTIONALITY

MAPublisher Import MAP View copies a MAP View from one document to another, including all the layers that are within that MAP View. This can be a useful tool when merging parts of several documents into a single document. An example might be to import a commonly used inset map.

PREREQUISITES

At least two documents must be opened to use Import MAP View. The active document does not need to contain any MAP View, but the second document must at least contain one MAP View.

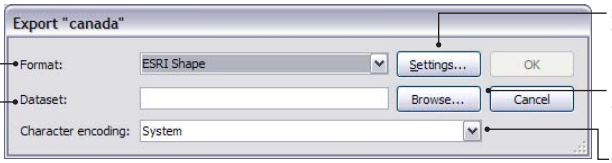
To access the function, click the **Import MAP View from Document...** item in the MAP Views panel options menu.

IMPORTING A MAP VIEW

The Import MAP View dialog box will show all other documents currently open, along with all the MAP Views they contain. Simply select the MAP View you wish to import into the current document, and click OK to import the MAP View and MAP Layers.

Export

MAP Views panel > *Export* and buttons *(MAP View)* *(MAP Layer)*



Format - Select the export format for the selected layer or MAP View.

Dataset - Displays the directory path for the export of the currently selected layer or MAP View. You can also manually type in the dataset location .

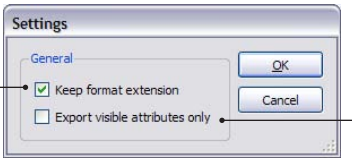
Settings - Opens a Settings dialog box for the input of extra parameters (see below).

Browse - Opens a Data Source browser to enable the selection of an export directory.

Character Encoding - Assign a codec if the attribute information held in the selected layer or MAP View uses a double byte character set.

EXPORT SETTINGS

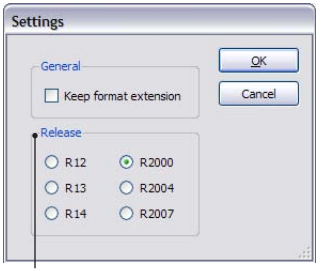
General Settings



Keep format extension - Check this option to export layers with their feature extension (_area, _line, _point, or _text) which may have been appended to layer names during import.

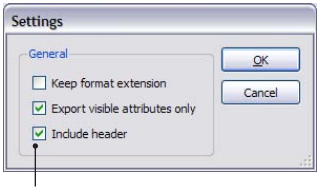
Export visible attributes only - Check this option to export only the attributes that are currently visible in the MAP Attributes panel.

AutoCAD Settings



Release Version - Specify the AutoCAD version number you wish to export to.

Delimited XY Text Data Settings



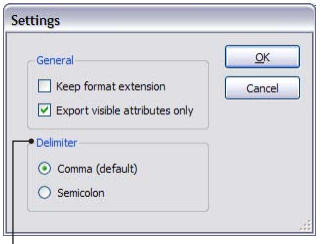
Include header - Add the column headers at the first line of the exported text file

MicroStation Settings

Area Fills - Controls whether or not fill linkages will be written out for ellipses, shapes, and solids.

Coordinate Units - Specifies how feature coordinates will be interpreted and converted (Master, Sub or Units of Resolution).

MIF/MID Settings

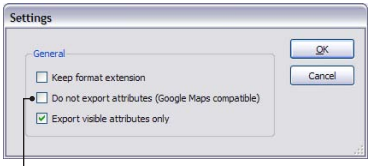


Delimiter - Set the fields delimiters to either comma or semicolon

E00 Settings

E00 Compression Level - Set the compression of the exported E00 file (default is *None*).

KML Settings



Do not export attributes - Check this option for export to KML to be used in Google Maps (Google Maps does not support KML files with attribute values).

FUNCTIONALITY

MAPublisher supports the export of single MAP Layers or whole MAP Views to various GIS formats, maintaining all georeferencing and attribute information. The following export formats are supported:

CAD (*.dxf) (*.dwg)
Delimited Text Data (*.csv) (*.tsv) (*.txt)
ESRI Interchange File (*.e00)
ESRI ArcInfo Generate (*.gen)
ESRI Shapefile (*.shp)
GML (Simple Features 3.1.1) (*.gml / *.xsd)
KML (*.kml)
MapInfo MIF/MID (*.mif / *.mid)
MapInfo TAB (*.tab)
Microstation Design (*.dgn)

NOTE: Exporting a MAP View to CAD or MicroStation format will assemble all hosted layers into a single file.

PREREQUISITES

The Export function will export a single selected Adobe Illustrator layer contained in a MAP View or all layers contained in a specified MAP View. Therefore both imported and user created MAP Views will contain MAP Layers that are suitable for export to GIS formats.

USING MAP EXPORT

To open the export function, first select the MAP Layer or MAP View you wish to export in the MAP Views panel. In the panel options menu, click **Export** *"<Layer/MAP View name>".*
Alternatively, select a MAP View and click button , or select a MAP Layer and click button .

NOTE: You cannot export multiple MAP Views or multiple layers that have been selected individually. Only single MAP Views or single layers can be exported at one time.

Within the dialog box select the export **Format** you require, and then click the **Settings** button.

Keep Format Extension

The MAP Layer or MAP View you are exporting will be the default name of the exported file. However the feature type text (i.e. _area, _line, _point, or _text) appended to Adobe Illustrator layers by MAPublisher in the Import process, will be removed during the export process, unless you specify that you wish to keep this. If you wish to keep the feature type text, check the Keep format extension option.

Export Visible Attributes

Check this option to export only the attributes that are currently visible in the MAP Attributes panel. If this option is not checked, all attribute columns (including MAPublisher #Property attributes) will be exported.

KML Settings

Google Maps does not support vector data containing attribute information. In order to export to KML for use in that application, the specific KML option *do not export attributes* must be checked. Additional settings are not required for export to KML for use in Google Earth.

AutoCAD Settings

When exporting to AutoCAD, click the Settings button to specify the AutoCAD version.

Coordinate Units

When exporting to Microstation, click the Settings button to specify the desired unit type.

Area Fills

When exporting area type data to the Microstation file format the user may enable/disable fills.

Choosing a Destination Folder

Most of the export formats will require the selection of a destination folder only. For export to **ESRI** or **MapInfo** formats, click the **Browse** button to specify a destination folder. Click the **OK** button to export your MAP Layer.

In the case of exporting to **AutoCAD** format you will be required to specify a name for the exported file, and select the file extension *(DXF* or *DWG)* to be used. For **MicroStation** formats, you will be required to specify a name for the exported file. If you wish to export to either of these formats, click the **Browse** button to name the export file, and then choose the file format from the **Format** drop-down list.

ADDITIONAL NOTES

Valid Area Direction (Area Layer Exports)

When exporting Area layers to GIS formats, polygon outlines must have a positive *Area* value, whereas holes held inside compound paths (or complex shapes) must have a negative *Area* value. If you have values for polygons in the *#Area* property column of your MAP Attribute table which contradict these guidelines, you can use the following tools to convert the MAPublisher area calculation from a negative to a positive value or vice versa:

- **Flip Lines** tool (chapter 8) for convert multiple areas:
- Create a **Selection Filter** (chapter 11) to select all elements that have an *#Area* of less than zero (to select negative values) or greater than zero (to select positive values). Then start the *Flip Lines* function.
- *#AreaDirection* property value (page 60) for convert areas one by one:
- Select the area to edit and then choose the alternate value for #AreaDirection in the MAP Attributes panel.

#TEXT Property (Text Exports)

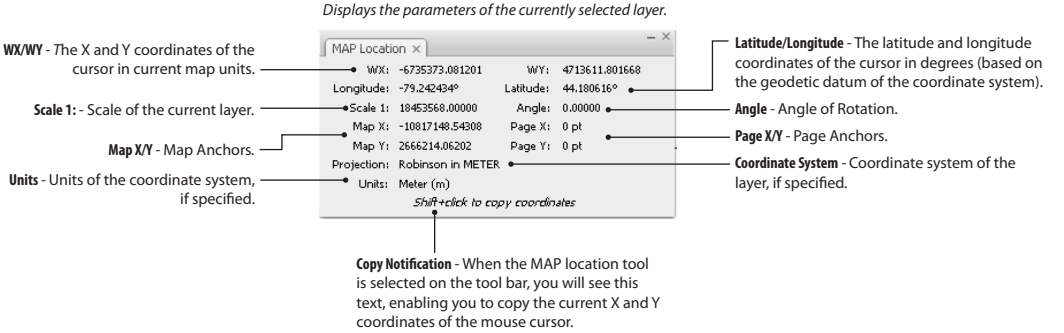
It is not possible to export values in the #Text property column. An alternative is to create a new string attribute column and assign it an expression of #Text. See **Edit Schema** (page 66).

Add/Edit Geodetic Datasource

Please see appendix A2 for further information on how to edit the geodetic datasource.

MAP Location Tool

MAP Toolbar, or *Tools> MAP Location Tool* *and Window > MAPublisher > MAP Location*


Displays the parameters of the currently selected layer.
WX/WY - The X and Y coordinates of the cursor in current map units.
Scale 1: - Scale of the current layer.
Map X/Y - Map Anchors.
Units - Units of the coordinate system, if specified.
MAP Location
WX: -6735373.081201
WY: 4713611.801668
Longitude: -79.242434°
Latitude: 44.180616°
Scale 1: 18453568.00000
Angle: 0.00000
Map X: -10817148.54308
Page X: 0 pt
Map Y: 2666214.06202
Page Y: 0 pt
Projection: Robinson in METER
Units: Meter (m)
Shift+click to copy coordinates
Latitude/Longitude - The latitude and longitude coordinates of the cursor in degrees (based on the geodetic datum of the coordinate system).
Angle - Angle of Rotation.
Page X/Y - Page Anchors.
Coordinate System - Coordinate system of the layer, if specified.
Copy Notification - When the MAP location tool is selected on the tool bar, you will see this text, enabling you to copy the current X and Y coordinates of the mouse cursor.

FUNCTIONALITY

The MAPublisher Location Tool displays the coordinates of the mouse cursor on the selected map layer in current **Map Units** and in **Degrees**. Latitude and longitude values are in reference to the geodetic datum set in the coordinate system definition. When no georeferencing is present on the selected layer, the dialog box will display the coordinates in **Page Units.** The dialog box will also display the **Map** and **Page Anchors**, the **Scale**, **Angle** of rotation, and the **Coordinate System** and **Units** of the MAP Layer.

The MAP Location Tool also enables the X and Y position of the cursor in the current map units (WX and WY) to be copied to the clipboard. An example of a use of this function is that it enables you to build point files in an external text editor; files which can then be re-imported with MAPublisher. Coordinates are copied with the X value first and Y value second, and are delimited by a comma. For example: -79.396527,43.631979

USING THE MAP LOCATION TOOL

To use the **MAP Location Tool**, click the button in Adobe Illustrator Tools panel or on the MAP Toolbar**,** or open the panel through *Window > MAPublisher > MAP Location*. With the cursor scroll around your map document, and note how the map units update with the location of the mouse. With the MAP Location Panel open the values will be constantly updated regardless of the tool that is selected.

When the **MAP Location Tool** button is enabled in the Adobe Illustrator Tools panel, users are able to copy the coordinates of a specific location. The appropriate layer must be selected in the MAP Views panel, the MAP View containing the layer will determine the MAP Units and coordinate system used to display the positions. To copy the positions:

- Position the cursor at the desired location.
- Click the document while holding the Shift key.

The X and Y position in map units are copied to the clipboard and can be paste into any text editor. Only one set of coordinates can be copied at once. When shift+click is used again, the values copied previously will be overwritten.

NOTE: When the cursor is placed outside of the MAP View extent of the selected layer, positions values are indicated as *Unavailable* .

MAP Attributes

MAPublisher can import GIS files into Adobe Illustrator while retaining both geographic vector and attribute information and makes it very easy to produce high quality maps.

This section will explain the principles of georeferencing and attribute information and how these are maintained within MAPublisher. Topics covered in this section are:

Attributes Foreword
MAP Attributes
Find & Replace Attributes
Edit Schema
Edit Expression
Join Table
Apply Expression

Attributes Foreword

ATTRIBUTE INFORMATION

The attribute table that forms part of a GIS map file is one of the most important parts of any data set. It is in the attribute table that we find important information such as street names for lines, zoning or zip code numbers for areas and elevations for points to go along with our vector line, area or point data. Along with vector line, area and point data imported as explained in the previous sections, MAPublisher also imports the attribute data table associated with any vector map file that it supports.

MAP LAYERS

Throughout this guide, an Adobe Illustrator layer containing georeferencing and/or attribute information will be referred to as a **MAP Layer**.

Each MAP Layer which can contain attribute information is symbolized in MAPublisher panels and dialog boxes with an icon depicting its feature type:

- Area layer *(e.g. county boundaries, urban areas, country outlines etc.)*
- Line layer *(e.g. rivers, roads, railways etc.)*
- Point layer *(e.g. town and city symbols, railway stations etc.)*
- Text layer *(e.g. text labels)*

MAPUBLISHER #PROPERTY ATTRIBUTES

In addition to the attribute values that were created upon data import or within a work session, Area, Line, Point and Text layers are also assigned a number of additional MAPublisher attribute columns. These property columns (prefixed with a #) are designed to indicate the physical properties of map art on the Adobe Illustrator canvas. Art can be modified directly from the attribute table by making edits to values in these columns.

The following property columns are attached to valid map layers in this version of MAPublisher:

Area layers

#ID	*describes the internal unique ID to refer to Adobe Illustrator artwork within the document. There will never be two pieces of artwork with the same #ID value at the same time. This property cannot be set.*
#Name	*describes the name of the polygon. Editing this property will change the name in the Layers panel.*
#AreaDirection	*describes the direction as clockwise or counter-clockwise. Editing this value will reverse the direction accordingly.*
#VertexCount	*describes the number of points in the art. This property cannot be set.*
#Style	*describes the Graphic Style in use. Editing this property will apply the selected style to the art.*
#StrokeWeight	*describes the stroke weight of the path. Editing this property will alter the stroke weight of the art.*
#Perimeter	*describes the perimeter of the area in world units. This property cannot be set.*
#PathClosed	*describes whether or not the path is closed (yes or no). Editing this value will open/close the path.*
#ArtScale	*describes the scaling of the line stroke. Editing this value will scale the stroke weight.*
#Area	*describes the area of the path in world units. This property cannot be set.*

Line layers

#ID	*describes the internal unique ID to refer to Adobe Illustrator artwork within the document. There will never be two pieces of artwork with the same #ID value at the same time. This property cannot be set.*
#Name	*describes the name of the polygon. Editing this property will change the name in the Layers panel.*
#VertexCount	*describes the number of points in the art. This property cannot be set.*
#Style	*describes the Graphic Style in use. Editing this property will apply the selected style to the art.*
#StrokeWeight	*describes the stroke weight of the path. Editing this property will alter the stroke weight of the art.*
#PathClosed	*describes whether or not the path is closed (yes or no). Editing this value will open/close the path.*
#Length	*describes the length of the path in world units. This property cannot be set.*
#ArtScale	*describes the scaling of the line stroke. Editing this value will scale the stroke weight.*

Point layers

#PageX	*describes the* x-coordinate in the document units of the current point.
#PageY	*describes the* y-coordinate in the document units of the current point.
#ID	*describes the internal unique ID to refer to Adobe Illustrator artwork within the document. There will never be two pieces of artwork with the same #ID value at the same time. This property cannot be set.*
#Name	*describes the name of the point. Editing this property will change the name in the Layers panel.*
#HorizontalScale	*describes the horizontal scaling of a point object. Editing this value will scale the symbol in the X axis.*
#VerticalScale	*describes the vertical scaling of a point object. Editing this value will scale the symbol in the Y axis.*
#Rotation	*describes the rotation in degrees of the art around its anchor point. Editing this value will rotate art.*
#Style	*describes the Symbol in use. Editing this property will apply the selected symbol to the art.*
#MapX	*describes the* x-coordinate in the world units of the current point.
#MapY	*describes the* y-coordinate in the world units of the current point.

Text layers

#PageX	*describes the* x-coordinate in the document units of the current point text. For text-on-a-path or text-in-a-path, this will be the x-coordinate of the first vertex on the associated path.
#PageY	*describes the* y-coordinate in the document units of the current point. For text-on-a-path or text-in-a-path, this will be the y-coordinate of the first vertex on the associated path.
#ID	*describes the internal unique ID to refer to Adobe Illustrator artwork within the document. There will never be two pieces of artwork with the same #ID value at the same time. This property cannot be set.*
#FontSize	*describes the font size used by the text.*
#FontFamily	*describes the font family used by the text.*
#Name	*describes the name of the text field. Editing this property will change the name in the Layers panel.*
#Text	*describes the contents of the text. Editing this property will edit text on the page.*
#TextLength	*describes the number of characters in the contents of the text art. This property cannot be set.*
#Rotation	*describes the rotation in degrees of the art around its anchor point. Editing this value will rotate art.*
#Style	*describes the Character Style in use. Editing this property will apply the selected style to the art.*
#PageX	*describes the* x-coordinate in the world units of the current point text. For text-on-a-path or text-in-a-path, this will be the x-coordinate of the first vertex on the associated path.
#PageY	*describes the* y-coordinate in the world units of the current point. For text-on-a-path or text-in-a-path, this will be the y-coordinate of the first vertex on the associated path.

Warning - #ID property is not persistent; if you save a document and re-open it you will find that the #ID has changed. The value will usually not change over the life of a document session, but there are Adobe Illustrator operations that can cause the value to change.

IMPORTANT ADOBE ILLUSTRATOR COMPATIBILITY NOTES

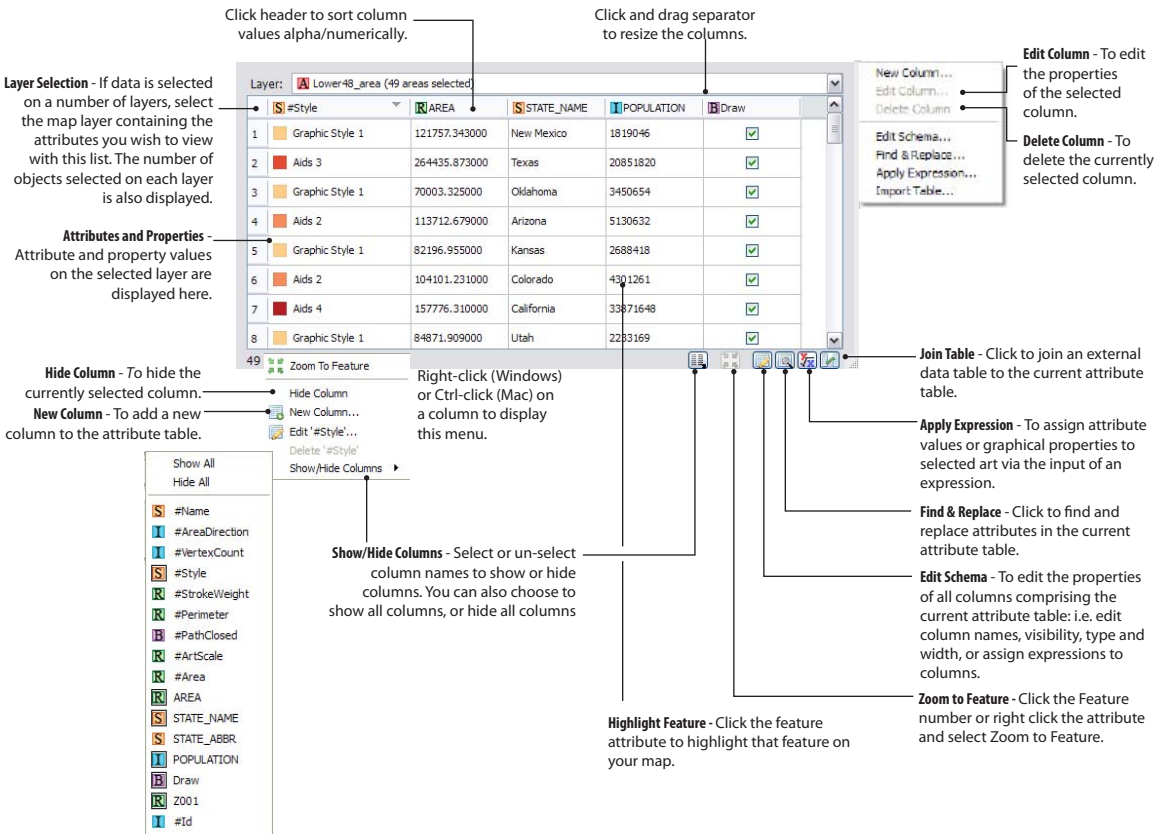
Some Adobe Illustrator functions may cause the link between artwork objects and their attributes to be broken, resulting in possible data loss. These functions are:

- Compound path (Make)
- Pathfinder
- Live Paint
- Blob brush (Adobe Illustrator CS4)

If required, users should first duplicate their working layer in the Adobe Illustrator Layers panel before using these functions. The original layer can be kept for labelling (see chapter 10) or for information purposes.

MAP Attributes

Window > *MAPublisher* > *MAP Attributes* and *MAP Toolbar*


Click header to sort column values alpha/numerically.
Click and drag separator to resize the columns.
Layer Selection - If data is selected on a number of layers, select the map layer containing the attributes you wish to view with this list. The number of objects selected on each layer is also displayed.
Attributes and Properties - Attribute and property values on the selected layer are displayed here.
Edit Column - To edit the properties of the selected column.
Delete Column - To delete the currently selected column.
Layer: Lower48_area (49 areas selected)
#Style
AREA
STATE_NAME
POPULATION
Draw
1 Graphic Style 1 121757.343000 New Mexico 1819046
2 Aids 3 264435.873000 Texas 20851820
3 Graphic Style 1 70003.325000 Oklahoma 3450654
4 Aids 2 113712.679000 Arizona 5130632
5 Graphic Style 1 82196.955000 Kansas 2688418
6 Aids 2 104101.231000 Colorado 4301261
7 Aids 4 157776.310000 California 33871648
8 Graphic Style 1 84871.909000 Utah 2233169
49
New Column...
Edit Column...
Delete Column
Edit Schema...
Find & Replace...
Apply Expression...
Import Table...
Zoom To Feature
Hide Column
New Column...
Edit '#Style'...
Delete '#Style'
Show/Hide Columns
Hide Column - To hide the currently selected column.
New Column - To add a new column to the attribute table.
Right-click (Windows) or Ctrl-click (Mac) on a column to display this menu.
Show All
Hide All
#Name
#AreaDirection
#VertexCount
#Style
#StrokeWeight
#Perimeter
#PathClosed
#ArtScale
#Area
AREA
STATE_NAME
STATE_ABBR
POPULATION
Draw
Z001
#Id
Show/Hide Columns - Select or un-select column names to show or hide columns. You can also choose to show all columns, or hide all columns
Join Table - Click to join an external data table to the current attribute table.
Apply Expression - To assign attribute values or graphical properties to selected art via the input of an expression.
Find & Replace - Click to find and replace attributes in the current attribute table.
Edit Schema - To edit the properties of all columns comprising the current attribute table: i.e. edit column names, visibility, type and width, or assign expressions to columns.
Zoom to Feature - Click the Feature number or right click the attribute and select Zoom to Feature.
Highlight Feature - Click the feature attribute to highlight that feature on your map.

FUNCTIONALITY

The MAP Attributes panel displays the map attribute and property attribute records for a map layer, which are linked to the map's graphic elements, and makes them available for editing. This panel is also the hub from which you can edit column schemas and visibility, add or delete columns, join tables, find and replace attributes, and apply expressions to selected art. Only the visible attributes of selected map features will be displayed in the dialog box.

USING THE MAP ATTRIBUTES PANEL

Viewing Attributes

Selected features are sorted per layer. The **Layer** drop-down list shows all the layers that currently have features selected, as well as the number of selected map objects for each layer (also reported at the base of the panel). The attribute values displayed in columns in the MAP Attributes panel can be sorted in ascending or descending order by clicking the column header. The widths of the columns may be changed by clicking the column separator and manually dragging it to resize as desired.

The type of attribute is indicated by an icon preceding the column name :

Boolean - columns contain True or False values
Integer - columns contain only whole numbers
Real - columns contain numbers carrying decimal values
String - columns can contain attributes that are both alpha and numeric

Editing Attributes

MAPublisher MAP Attributes panel is a fully editable spreadsheet environment. All attribute values may be edited except for certain MAPublisher Property attributes (see page 60). To change the value of a cell, double-click within the cell and enter the new value such as you would in a spreadsheet program. Keep in mind that you must enter values that correspond with a column's type (i.e. only enter numbers into a column of type *Real* or *Integer*). The edits will immediately be reflected in the map documents database records. Existing attribute records may also be edited or modified by performing a find and replace operation on them.

Column Visibility

Click the **Show/Hide Columns** button (or Right-click (Windows) or Ctrl-click (Mac) on a column in the dialog box) to edit the column visibility, either toggling visibility for individual columns or for all columns. It is also possible to edit the visibility of attribute columns with the **Edit Schema** tool (page 66).

Zoom To and Highlight Feature

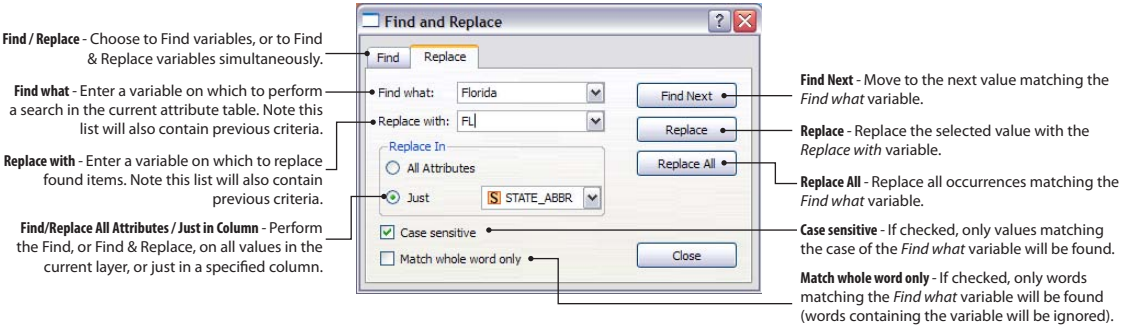
To zoom into a specific feature in the attribute table, select a single attribute and click the **Zoom to Feature** button. This will automatically fit this feature to your screen and highlight it allowing you to examine this feature closer or to simply locate it on your map. To highlight a specific feature on your page maintaining the current zoom level, click one attribute of that feature.

Property Attributes

The attribute table can also be configured to display property attributes for your datasets. These attributes describe the current assignment of graphical properties such as the stroke weight, style, rotation and scale etc that is currently associated with the data. These fields are editable and provide the ability to modify a map objects graphical properties directly within the context of the MAP Attributes panel itself. To edit a property attribute for a particular map object you may either double-click within the appropriate property cell and directly enter a value or choose from an available drop-down list depending on the property type you are editing. Once these changes have been entered into the MAP Attributes panel the modified art elements will be graphically updated within the map to reflect these changes.

Find & Replace Attributes

MAP Attributes panel > Find & Replace


Find / Replace - Choose to Find variables, or to Find & Replace variables simultaneously.
Find what - Enter a variable on which to perform a search in the current attribute table. Note this list will also contain previous criteria.
Replace with - Enter a variable on which to replace found items. Note this list will also contain previous criteria.
Find/Replace All Attributes / Just in Column - Perform the Find, or Find & Replace, on all values in the current layer, or just in a specified column.
Find and Replace
Find
Replace
Find what:
Florida
Replace with:
FL
Replace In
All Attributes
Just
STATE_ABBR
Case sensitive
Match whole word only
Find Next
Replace
Replace All
Close
Find Next - Move to the next value matching the *Find what* variable.
Replace - Replace the selected value with the *Replace with* variable.
Replace All - Replace all occurrences matching the *Find what* variable.
Case sensitive - If checked, only values matching the case of the *Find what* variable will be found.
Match whole word only - If checked, only words matching the *Find what* variable will be found (words containing the variable will be ignored).

FUNCTIONALITY

The Find & Replace tool allows for the searching and/or replacing of attribute values and properties contained in the MAP Attributes panel. Note only values in visible columns can be found and/or replaced.

USING FIND & REPLACE

Access the tool by clicking the *Find & Replace* button or menu item in the MAP Attributes panel.

Find Only

To use Find & Replace to easily find values, click the **Find** tab to enter your search criteria. Find criteria can be typed directly into the **Find what** entry field (previous criteria can be selected from the list). A search may be performed on all attributes by default, or only on specific columns contained within the MAP Attributes panel by enabling the **Just** option and choosing a column from the list. Criteria may be further refined by enabling the **Case sensitive** and **Match whole word only** options.

Once the search string has been entered click the **Find Next** button in order to perform the search. Search results can be seen in the MAP Attributes panel; the column header and row number containing the first matching record will be displayed in bold text. At this point you may progress searching for individual records by clicking again the *Find Next* button.

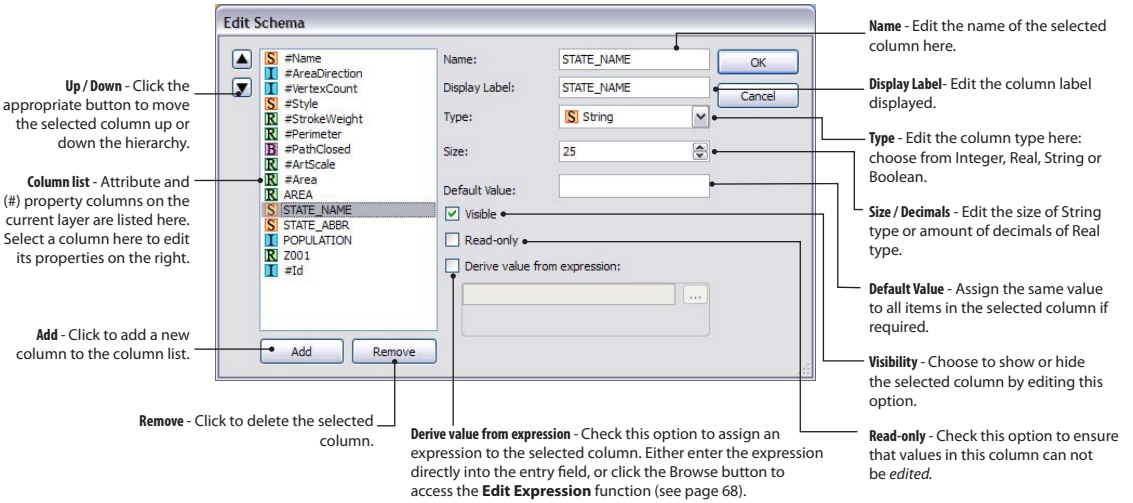
Find & Replace

To replace records selected through the *Find* operation click the **Replace** tab. Find & Replace criteria can be typed directly into the **Find what** and **Replace with** entry fields (previous criteria can be selected from the lists). A find and replace may be performed on all attributes by default, or only on specific columns contained within the MAP Attributes panel by enabling the **Just** option and choosing a column from the list. Criteria may be further refined by enabling the **Case sensitive** and **Match whole word only** options.

There are two methods to replace values. The first method requires you to approve each replacement manually by clicking the **Replace** button so that each instance of the attribute located via the search parameters is successively replaced in the map attribute table. The second method allows for the replacement of all found records simultaneously, accomplished by clicking the **Replace All** button.

Edit Schema

MAP Attributes panel > Edit Schema / Edit Column / New Column


Edit Schema
#Name
#AreaDirection
#VertexCount
#Style
#StrokeWeight
#Perimeter
#PathClosed
#ArtScale
#Area
AREA
STATE_NAME
STATE_ABBR
POPULATION
Z001
#Id
Name:
STATE_NAME
Display Label:
STATE_NAME
Type:
String
Size:
25
Default Value:
Visible
Read-only
Derive value from expression:
OK
Cancel
Add
Remove
Up / Down - Click the appropriate button to move the selected column up or down the hierarchy.
Column list - Attribute and (#) property columns on the current layer are listed here. Select a column here to edit its properties on the right.
Add - Click to add a new column to the column list.
Remove - Click to delete the selected column.
Derive value from expression - Check this option to assign an expression to the selected column. Either enter the expression directly into the entry field, or click the Browse button to access the Edit Expression function (see page 68).
Name - Edit the name of the selected column here.
Display Label- Edit the column label displayed.
Type - Edit the column type here: choose from Integer, Real, String or Boolean.
Size / Decimals - Edit the size of String type or amount of decimals of Real type.
Default Value - Assign the same value to all items in the selected column if required.
Visibility - Choose to show or hide the selected column by editing this option.
Read-only - Check this option to ensure that values in this column can not be edited.

In MAPublisher, the term **schema** is used to define the structure and makeup of the map attributes table.

FUNCTIONALITY

The Edit Schema function lets you edit and manage various components of your data's map attribute structure, including creating, editing and deleting columns, setting visibility preferences, and assigning expressions. Any changes made to the schema will instantly be reflected in the MAP Attributes panel.

USING EDIT SCHEMA

Select an object of the MAP Layer containing the attributes you wish to edit. It gets selected in the MAP Attributes panel. Access the tool by clicking the **Edit Schema** button or menu item in the MAP Attributes panel options menu.

Edit Schema will list all of the columns which currently exist in the MAP Layer attribute structure, including MAPublisher Property attributes (page 60). By default, imported or created attributes will be visible, whereas property columns will not be shown by default. Please note some #Property column structures cannot be edited (read only).

Editing Column Format

To rename a column enter the new text directly into the **Name** field.

Specify a data type by making the appropriate selection in the **Type** list. Please note the following:

- *String* columns can contain attributes that are both alpha and numeric.
- *Integer* columns contain only whole numbers.
- *Real* columns contain numbers carrying decimal values.
- *Boolean* columns contain True or False values.

To modify the amount of characters or decimals, enter a value into the **Size/Decimal** text box. You can also assign a **Default Value** for all new objects placed on the selected layer by entering text accordingly. Check or uncheck the **Visible** option to edit a column's visibility. Check or uncheck the **Read-only** option to edit a column's read/write status (i.e. values cannot be edited in the MAP Attributes panel if the column is read-only).

To assign an expression to the selected column, check the **Derive value from expression** option. Enter a valid expression in the Expression field. The **Expression Validity** icon will report if the expression entered is valid. Otherwise it will report and include additional warning notes. Alternatively click the **Browse** button to enter and edit expressions via the **Edit Expression** dialog box. This function is useful, for example, to populate the column values based on the contents of other columns and/or mathematical formulas.

The following are some examples of basic expressions which can be assigned to columns in *Edit Schema*.

"Ontario" *(applied to column = NAME)*
Result: All items are assigned the value "Ontario" in the NAME column.
"MAP Area 01" *(applied to column = #Style)*
Result: All area items are assigned the value "MAP Area 01" in the #Style column and are assigned the Graphic Style "MAP Area 01" on the page.
45 *(applied to column = #Rotation)*
Result: All point items are assigned the value 45 in the #Rotation column and are rotated to 45° on the page.

NOTE: String values are case-sensitive and must be entered in quotes ("...").

Adding, Deleting and Re-Ordering Columns

Stipulations regarding the display order of attribute columns in the MAP Attributes panel can be set by reordering the existing list according to your preferences. Any column may be promoted in the list/attribute table by selecting it in the list and clicking the Up and Down buttons to move it up or down within the list. Columns will display in the MAP Attributes panel according to the display order established in Edit Schema.

To create a new column, click the **Add** button and input the desired column properties. To delete an existing column, choose it from the available list and click the **Delete** button.

Click **OK** to confirm your edits to the attribute structure on the selected layer. These edits will immediately be visible in the MAP Attributes panel.

EDIT COLUMN

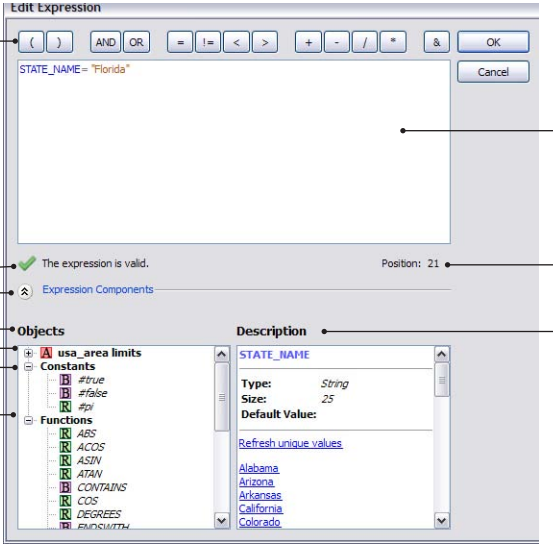
Edit Schema can also be accessed via the **Edit Column** context menu. Within the MAP Attributes panel, select the column you wish to edit, right-click the column heading or cell and click **Edit**. This opens the **Edit Schema** dialog box with the same column immediately selected in the column list.

NOTES:

- MAPublisher does not allow a space to be entered in a column name. When a space is entered in a column name an underscore is input instead. This will avoid complications when exporting to external formats that might not support spaces.
- Some external file formats have limits on the number of characters allowed for field names. Therefore, during the export from MAPublisher, some field names might get truncated to comply to the chosen external file format. For example, ESRI shapefiles are limited to 10 characters (confirmed up to ArcGIS 9.2), ESRI Interchange File (.e00) to 16 characters, MapInfo to 30 characters.

Edit Expression

Accessed from Edit Schema, Apply Expression, New/Edit Selection Filter, MAP Stylesheet Editor



Operator buttons - Click to insert an operator into the expression at the current cursor position.

Expression Validity - Indicates if the expression is valid or invalid. If invalid, additional info is reported.

Advanced toggle - Click to show or hide the Expression Components section

Objects - List of attribute and property columns, constants and functions for use in the expression. To expand a folder click; to collapse click. Double-click items to insert them into the expression.

Layer attributes - List of the attribute and property columns which comprise the current layer.

Constants - /Insert either True or False into the expression if required.

Functions - List of functions for use in the expression if required.

Expression Entry - Where all composition of the expression occurs. Use the keyboard, operator buttons, and/or the Objects list to compose the expression.

Cursor Position - Position of the current text entry point.

Description - Displays information on the currently selected item in the Objects panel, i.e. a description and example of the function or constant, or information regarding the format of the MAP layer along with it's attribute values.

When selecting an attribute, click the link **display unique values** to display all the attribute values of the selected attribute column.

FUNCTIONALITY

The MAPublisher Edit Expression tool provides for the entry and edit of expressions for use in the generation of new attribute values and properties, to make selections or to apply styles. Expressions can be entered using the keyboard, and/or by selecting from listed column names, operators and functions.

Edit Expression provides functionality for a number of tools:

Edit Schema *(page 66):* To create or edit an expression for the generation of values in an attribute or column.
(MAP Attributes panel > Edit Schema > Derive value from expression > Browse)

Apply Expression *(page 74):* To apply an expression to an attribute or property column for selected art only.
(MAP Attributes panel > Apply Expression> Browse)

New/Edit Selection Filter *(chapter 11):* To create or edit expression criteria for use in selecting map data.
(MAP Selection Filters panel > New/Edit Selection Filter > Browse)

MAP Stylesheet Editor *(chapter 9):* To create or edit an expression for use in styling map data.
(MAP Stylesheets panel > Edit MAP Stylesheet > Advanced Expression > Browse)

ENTERING EXPRESSIONS

Expression can be built using the keyboard and/or by clicking the operator buttons or items in the **Objects** list (attributes name and values, constants and functions). These items are colour coded to ease the identification: attribute names in purple, string values in orange, operators and numerical values in grey, constants in green and functions in black. Clicking any of the operator buttons or double-clicking an item from the **Objects** list inserts that item into the expression.

It is recommended to use the interface rather than the keyboard to build expressions, because functions are formatted correctly (e.g. with brackets), and, for attribute values of type strings, quotations marks are added

automatically. Besides, expressions are case-sensitive. For string comparison, all strings values can be converted to a same case using the appropriate function (*LOWER("string")* or *UPPER("string")*). However, the keyboard is best used for deletions.

Validity

The validity of the expression will be displayed below the Expression Entry field, and will be updated as you build the expression. The **Expression Validity** icon will report if the expression entered is valid. Otherwise it will report and include additional warning notes.

Operator Buttons

Click to insert an operator at the current cursor position. Available operators are as follows:

(	*Open clause operator*	**<**	*Logical less than comparator*
)	*Close clause operator*	**>**	*Logical greater than comparator*
AND	*Logical AND operator*	**+**	*Mathematical addition operator*
OR	*Logical OR operator*	**-**	*Mathematical subtraction operator*
=	*Logical equal to comparator*	**/**	*Mathematical division operator*
!=	*Logical not equal to comparator*	*****	*Mathematical multiplication operator*

Expression Components

Items in the *Objects* list fall into three categories. Information on a selected item is displayed in the Description panel. Double-click to insert an object at the current cursor position. Available objects are as follows:

<MAP Layer>*
List of #property columns (see page 37)
*List of attribute columns***

Constants

#true	*Boolean true value*
#false	*Boolean false value*

** Layer may vary depending on tool. For Edit Schema, Apply Expression and New/Edit Selection Filter, the current layer is displayed. In the MAP Stylesheet Editor, all layers hosted by the stylesheet are displayed.*

*** Unique values contained in each attribute column can be viewed in the Description panel.*

Descriptions and examples have been provided for each function and parameter in the Description panel.

Functions

ABS	*Absolute value of a number*
ACOS	*Inverse of the cosine of an angle*
ASIN	*Arcsine of an angle*
ATAN	*Arctangent of an angle*
CONTAINS	*True if source string contains search string*
COS	*Cosine of an angle*
DEGREES	*Converts values from radians to degrees*
ENDSWITH	*Returns true is the source string ends with the suffix string*
IF	*Based on a conditional statement*
LIKE	*Searches the source string using wildcards*
LOWER	*Strings converted to lower case*
NUMBER	*String values as numbers*
POW	*Base to the power of an exponent*
PROPER	*Strings converted to capital case*
RADIANS	*Converts values from degrees to radians*
REGEX	*Searches the source string using a regular expression*
ROUND	*Rounded to specified decimals of precision*
SIN	*The sine of an angle*
SQRT	*Square root of a value*
STARTSWITH	*Returns true if the source string starts with the prefix string*
TAN	*Tangent of an angle*
UPPER	*Strings converted to upper case*

Confirmation

When you have finalized your expression and it has been validated, click **OK**. The expression is inserted into the expression field of the appropriate tool. The Edit Expression tool can be re-opened if further edits are required.

NOTE: String values are case-sensitive and must be entered in double quotes ("...").

Example Basic Expressions

APPLY EXPRESSION

"Ontario" *(applied to column = NAME)*
Result: All selected items are assigned the value "Ontario" in the NAME column.

"MAP Area 01" *(applied to column = #Style)*
Result: All selected area items are assigned the value "MAP Area 01" in the #Style column and are assigned the Graphic Style "MAP Area 01" on the page.

45 *(applied to = #Rotation)*
Result: All selected point items are assigned the value 45 in the #Rotation column and are rotated to 45° on the page.

SELECTION FILTER

NAME = "Ontario"
Result: All items with the value "Ontario" in the NAME column are selected.

POPULATION < 1000000
Result: All items with values less than one million in the POPULATION column are selected.

NAME = "Ontario" OR NAME = "Alberta"
Result: All items with the value "Ontario" OR "Alberta" in the NAME column are selected.

NAME = "Ontario" AND POPULATION < 1000000
Result: Only the items containing the value "Ontario" in the NAME column AND values less than one million in the POPULATION column are selected.

MAP STYLESHEET

NAME = "Ontario"
Result: All items with the value "Ontario" in the NAME column are assigned the selected style.

POPULATION < 1000000
Result: All items with values less than one million in the POPULATION column are assigned the selected style.

NAME = "Ontario" OR NAME = "Alberta"
Result: All items with the value "Ontario" OR "Alberta" in the NAME column are assigned the selected style.

NAME = "Ontario" AND POPULATION < 1000000
Result: Only items containing the value "Ontario" in the NAME column AND values less than one million in the POPULATION column are assigned the selected style.

Example Complex Expressions

SELECTION FILTER or MAP STYLESHEET

LIKE (NAME, "*New*")
Result: all items with the string of letters "New" in the NAME column are selected (e.g. "New Brunswick" and "Province of Newfoundland")

STARTSWITH (NAME, "o")
Results: all items that starts with the letter "o" ("Ontario") are selected.

EDIT SCHEMA

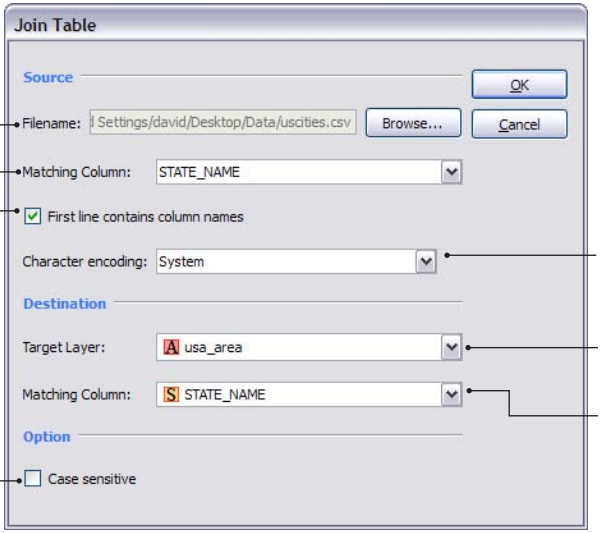
LOWER(NAME) *(applied to column = name)*
Result: All items in column name are assigned the value of the column NAME in lower case (e.g. "ontario" for "Ontario", "new brunswick" for "New Brunswick")

PROPER(name) *(applied to column = Proper_name)*
Result: All items in Proper_name are assigned the value of the column name in proper case (or capital case) (e.g. "Ontario" for "ontario", "New Brunswick" for "new brunswick").

ROUND((POPULATION/ AREA),3) *(applied to column=density)*
Result: All items are calculated as "population divided by area", rounded to three decimals.

Join Table

MAP Attributes panel > Join Table



Source Table - Lists the selected external data table and its path. Click the Browse button to select the data table you wish to import.

Source Matching Column - Select a column from the source table to match to a column in the destination layer.

First line contains column names - For Delimited Text type tables, check this box to use the first line to derive column names.

Case sensitive - If checked, values from the two matching columns will be matched up case-sensitively.

Character Encoding - Assign a codec if the attribute information held in the selected dataset uses a double byte character set.

Target Layer - Select the layer containing the MAP Attribute table you are going to join the source table with.

Destination Matching Column - Select a column from the destination layer to match to a column in the Source Table.

FUNCTIONALITY

Join Table provides the ability to merge external data tables directly into an existing MAP Layer attribute schema in order to create a single extended attribute table. Three of the most common table formats are supported:

• **DBase** (*.dbf) • **USGS SDTS** (*.ddf) • **Delimited Text** (*.csv) (*.tsv) (*.txt) • **Excel** (*.xls)

When exporting tables from spreadsheet applications for use with MAPublisher the preferred format to use is Delimited Text (*.csv).

PREREQUISITES

In order to successfully join a table into an existing attribute schema, both MAP Layer and data table must share at least one common attribute column with matching values. The column must be of a matching type (i.e. String, Real, Integer, Boolean) in both the Source and the Destination table.

Access the Join Table tool by clicking the **Join Table** button or options menu item in the MAP Attributes panel.

USING JOIN TABLE

Source Table

Click the **Browse** button to select the data table for import. When the file has been selected, select a common column by selecting an appropriate entry in the **Matching Column** drop-down list.

In MAPublisher, double byte characters are supported in attributes on import, allowing such attributes to be used for labelling and export. To assign a codec suitable for your selected dataset, choose an appropriate entry from the **Character Encoding** drop-down list.

If the table contains column names as headers, check the **First line contains column names** option. If it does not contain headers do not check this option and each column will be assigned a default heading name: Column1, Column2, etc.

Destination Table

Choose the attribute table that you wish to join the data table to. This can be achieved by choosing a MAP Layer from the **Target Layer** list. When the destination layer has been selected, select a common column by selecting an appropriate entry in the **Matching Column** drop-down list. This column must match the format and values as the column selected in the *Source Table* section.

Additional Option

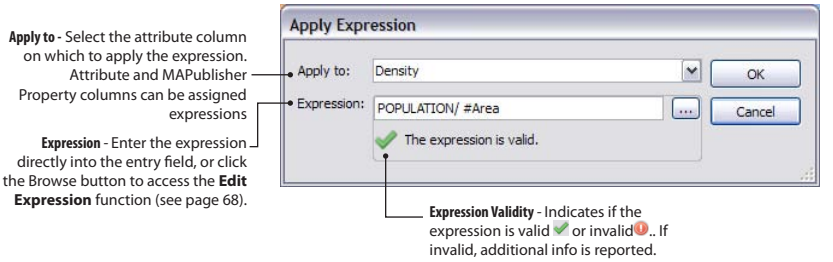
If the **Case sensitive** option is checked, the column entries from the two matching columns will only be matched by case. For example, if you have a mixture of upper or lower case entries in the data table that is mirrored in the destination attribute table, you should check this box. If one of the matching columns contains values in lowercase, and the other contains values in uppercase, for example, you should not check this box.

RESULTS

When you click **OK,** the data table will be added to the attribute table on the destination MAP Layer and may be viewed in the MAP Attributes panel. Notice that the matching column in your data table has also been added, but has been appended with a 1 if the column names were identical in the source and destination tables.

Apply Expression

MAP Attributes panel > Apply Expression


Apply to - Select the attribute column on which to apply the expression. Attribute and MAPublisher Property columns can be assigned expressions
Expression - Enter the expression directly into the entry field, or click the Browse button to access the Edit Expression function (see page 68).
Apply Expression
Apply to:
Density
Expression:
POPULATION/ #Area
The expression is valid.
OK
Cancel
Expression Validity - Indicates if the expression is valid or invalid. If invalid, additional info is reported.

FUNCTIONALITY

The Apply Expression tool allows for the assignment and application of expressions to currently selected art for the purpose of assigning attributes, assigning properties, or transforming artwork. For example, the tool can be used to assign attribute values based on values in other columns, assign graphic styles to selected elements, or transform data on the page via the assignment of a rotation value.

Note that property attributes are dynamic. Changes made to them in the map attribute table are reflected immediately in the graphical properties and on-screen display of the data to which they are linked. Expressions can be generated and applied to data based on the values found in an existing attribute column, providing a one-step process to transform a vast number of different objects in a single operation.

APPLYING EXPRESSIONS

Ensure the data required for the application of the expression is selected, and that layer is selected in the MAP Attributes panel. Then access the tool by clicking the **Apply Expression** button or menu item in the same panel.

First specify a column from the **Apply to** list to specify which attribute column the expression will be applied to. The columns listed here are representative of the attribute structure unique to the data layer currently displayed in the attribute table as well as the standard MAPublisher property attributes.

To assign an expression to a column, enter a valid expression in the Expression text box. The **Expression Validity** icon will report if the expression entered is valid. Otherwise it will report and include additional warning notes. Alternatively, click the **Browse** button to enter and edit expressions via the **Edit Expression** tool (page 46).

The following are some examples of basic expressions which can be assigned to selected data with *Apply Expression*.

"Ontario" *(applied to column = NAME)*
Result: All selected items are assigned the value "Ontario" in the NAME column.

"MAP Area 01" *(applied to column = #Style)*
Result: All selected area items are assigned the value "MAP Area 01" in the #Style column. Same items are assigned the Graphic Style "MAP Area 01" on the page.

45 *(applied to = #Rotation)*
Result: All selected point items are assigned the value 45 in the #Rotation column. Items are rotated to 45° on the page.

Click **OK** to apply the expression to the selected data, updating the values in the selected attribute column and transforming data as appropriate.

Plotting Points

The ability to place points onto a map is a fundamental part of cartography. Points can represent the locations of towns and cities, shops and malls, airports and train stations and more. MAPublisher provides the functionality to create or plot points in vector format.

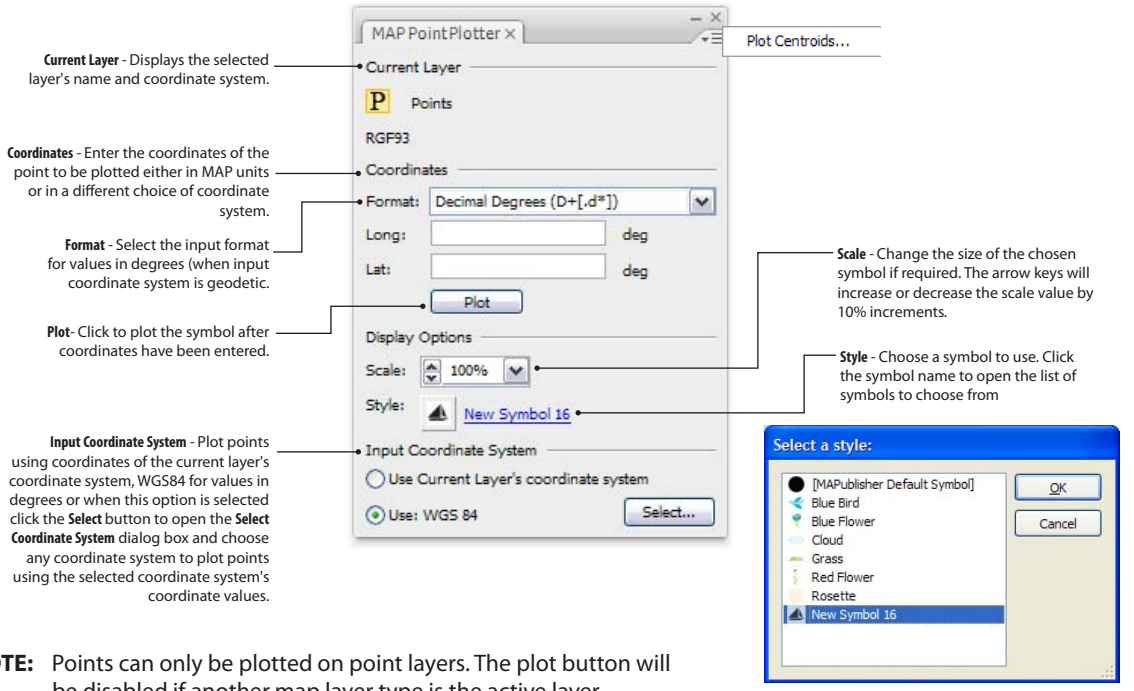
There may be times when you wish to quickly add a point or a small group of points to your map but you do not have a GIS or ASCII file containing these points ready for import. Alternatively your map may be in a projection that holds coordinates in linear units, yet the coordinates of your point locations are in angular units (i.e. degrees).

Provided you have a fully specified MAP View, and know the coordinates (coordinate system and unit can be specified) for the locations you wish to plot, you can use the MAPublisher Point Plotter to have your points automatically added at their correct locations.

Topics covered in this section are:
MAP Point Plotter
Plot Centroids

MAP Point Plotter

Window > *MAPublisher* > *MAP Point Plotter* and *MAPublisher Toolbar*


Current Layer - Displays the selected layer's name and coordinate system.
Coordinates - Enter the coordinates of the point to be plotted either in MAP units or in a different choice of coordinate system.
Format - Select the input format for values in degrees (when input coordinate system is geodetic.
Plot- Click to plot the symbol after coordinates have been entered.
Input Coordinate System - Plot points using coordinates of the current layer's coordinate system, WGS84 for values in degrees or when this option is selected click the **Select** button to open the **Select Coordinate System** dialog box and choose any coordinate system to plot points using the selected coordinate system's coordinate values.
MAP PointPlotter
Plot Centroids...
Current Layer
Points
RGF93
Coordinates
Format: Decimal Degrees (D+[.d*])
Long: deg
Lat: deg
Plot
Display Options
Scale: 100%
Style: New Symbol 16
Input Coordinate System
Use Current Layer's coordinate system
Use: WGS 84
Select...
Scale - Change the size of the chosen symbol if required. The arrow keys will increase or decrease the scale value by 10% increments.
Style - Choose a symbol to use. Click the symbol name to open the list of symbols to choose from
Select a style:
[MAPublisher Default Symbol]
Blue Bird
Blue Flower
Cloud
Grass
Red Flower
Rosette
New Symbol 16
OK
Cancel

NOTE: Points can only be plotted on point layers. The plot button will be disabled if another map layer type is the active layer.

PREREQUISITES

In order to plot points using the Point Plotter, you must first have a fully georeferenced MAP View in your document, as this function will use the coordinate system of that MAP View in order to generate points. Furthermore you must create a new Adobe Illustrator layer in which your points will be placed, as the software will not support multiple feature types on the same layer. Remember once you have created a Point layer, you must drag it into the desired MAP View, specifying **Point** in the Define Layer dialog box.

USING POINT PLOTTER

Setting up the Symbol Selection

The symbols used by Point Plotter are a direct reproduction of those that exist in the Adobe Illustrator **Symbols** panel. To open the Adobe Illustrator symbols panel, click the menu *Window* > *Symbols*. If you wish to add points to this panel, create your symbols as closed Adobe Illustrator objects and drag them into this panel. Alternatively, open the **MAP Symbols** file from the *Helpful Styles & Symbols* folder on your MAPublisher CD or local drive (see Appendix 4), and drag the symbols into your Adobe Illustrator Symbols panel.

Entering Coordinates

When the **Use Current Layer's coordinate system** option is toggled, coordinate values can be entered in the current MAP units of the coordinate system of the MAP View containing the selected layer.

When the **Use: WGS 84** option is toggled, the **Select** button will become enabled. Clicking the **Select** button will open the **Select Coordinate System** dialog box. Choose any coordinate system, the coordinates values entered to plot points will be in the unit (Point Style) for this coordinate system.

When the selected or default coordinate system is projected, X and Y coordinates are entered in the unit (Point Style) of the coordinate system (e.g. metre, kilometre, feet). When the selected or default coordinate system is Geodetic, Lat and Long coordinates are entered in degrees. The values entered into the Latitude and Longitude text boxes may be entered in different formats:

- Decimal degrees (D+[.d*])
- Delimited Degrees Minutes Seconds (D+dMM'SS[.s*]")
- Degrees.Minutes (D+.MM[m*])
- Degrees.MinutesSeconds (D+.MMSS[s*])
- Packed DMS with decimal point((D)DDMMSS[.s*])
- Packed DMS ((D)DDMMSS[s*])

Items in [ ] are optional, * means zero or more digits, + means one or more digits.

NOTES:

- Lines of latitude run East-West (the Equator is an example), whereas lines of longitude run North-South (the Greenwich Meridian is an example). Positive degree values represent north latitudes and east longitudes. Negative degree values represent south latitudes and west longitudes. Directions can be entered either with positing/negative values or using the N, S, E or W letters preceding or following the numerical values, separated or not with a space.
- Valid delimiters for *Delimited Degrees Minutes Seconds* format are:
  - → *d* (degree), *single quote* (minute), *double quote* (second): e.g. 43d41'48.98"N
  - → *hyphen* (-) : e.g. 43-41-48.98N
  - → *space*: e.g. 43 41 48.98N
- *Packed* formats require the use of two digits for degrees of latitude (e.g. 1°N must be written 01) and 3 digits for degrees of longitude (e.g. 1°E must be written 001).

Examples of Latitude/Longitude values

Formats		Decimals Degrees	Delimited Degrees Minutes Seconds	Degrees.Minutes	Degrees. MinutesSeconds	Packed DMS with decimal point	Packed DMS
Avenza Office: **43°41'48.98"N 79°23'32.38"W** (= 48°41.8163'N | 79°23.5396"W) (= 48.6969°N | 79.3922°W)	Lat	43.6969N	43d41'48.98"N	43.418163N	43.414898N	434148.98N	43414898N
	Long	79.3922W	79d23'32.38"W	79.235396W	79.233238W	0792332.38W	079233238W
	Lat	43.6969	43 41 48.98	N43.418163	N 43.414898	434148.98	N 43414898
	Long	-79.3922	W 079 23 32.38	W79.235396	W 79.233238	-0792332.38	W 079233238
	Lat	N 43.6969	N 43-41-48.98	43.418163	43.414898	N 434148.98	43414898N
	Long	-079.3922	W 79-23-32.38	-079.235396	-079.233238	W 0792332.38	-079233238

Choosing a Symbol and Scale

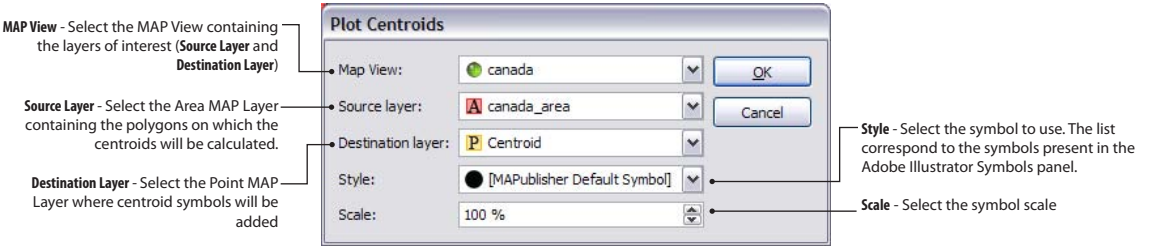
After entering coordinate values select an appropriate symbol to use by clicking the symbol name link. Again the symbols displayed are the symbols that currently exist in the Adobe Illustrator Symbols panel. To scale the symbol used, edit the **Scale** entry field. Clicking the **Up** and **Down** arrows will increase or decrease the value by 10%.

Plotting Points

Click **Plot** to plot the point in the designated MAP layer. To plot subsequent points, edit the coordinates, and also choose different symbols if required and click Plot again.

Plot Centroids

MAP Point Plotter panel > Plot Centroids


MAP View - Select the MAP View containing the layers of interest (**Source Layer** and **Destination Layer**)
Source Layer - Select the Area MAP Layer containing the polygons on which the centroids will be calculated.
Destination Layer - Select the Point MAP Layer where centroid symbols will be added
Plot Centroids
Map View:
canada
OK
Source layer:
canada_area
Cancel
Destination layer:
Centroid
Style:
[MAPublisher Default Symbol]
Scale:
100 %
Style - Select the symbol to use. The list correspond to the symbols present in the Adobe Illustrator Symbols panel.
Scale - Select the symbol scale

FUNCTIONALITY

The **Plot Centroids** function creates point symbols at the center of polygons. This function is useful for cartographic generalization purpose (e.g. replacing small island area by a symbol), or to simply add a meaningful symbol at the center of areas. For single polygons, the centroid can be assimilated to the center of mass of the surface. For polygons grouped into a compound path, the centroid of the largest polygon is used.

NOTE: The centroid of a Bezier polygon (smoothed path) may not be completely accurate because only the anchor points are used to calculate the centroid's position. If necessary, use the Adobe Illustrator **Add Anchor Points** function (*Object > Path > Add Anchor Point*s) before running Plot Centroids on Bezier polygons.

PREREQUISITES

The document must contain a fully georeferenced MAP View that includes a MAP layer of type Area with polygons, and a MAP layer of type Point (where the centroids will be added). Furthermore, the symbol of your choice must be present in the Adobe Illustrator Symbols panel.

USING PLOT CENTROIDS

Plot Centroids is located in the Point Plotter panel options menu.

- Select first the **MAP View** that contains the layers concerned by the function.
- Select the **Source Layer** containing the polygons for which the centroids will be plotted (MAP Layer of type Area).
- Choose the **Destination Layer** of type Point in which the centroids will be added.
- Finally select the symbol **Style** and **Scale** to apply.
- Click **OK** to produce a symbol at the centroid of all the polygons on the source layer.

RESULTS

Symbols are added to the specified Point MAP Layer specified. Depending on the type of polygon (single or compound path), symbols are located on the center of the polygons or at the center of the biggest polygon of a group.

Example: result of plotting centroids on a Canadian provincial Area layer.

Drawing Tools

MAPublisher benefits from Adobe Illustrator drawing tools. Any artwork created on a specified MAP layer will be incorporated into the map data on that layer, and can therefore be rescaled and reprojected. If the new artwork is of the same feature type as the MAP Layer, it will be automatically added to the attribute table of that layer. Similarly, objects can be deleted and moved between layer with the basic Adobe Illustrator tools. Therefore it is very easy to quickly add and delete features to MAP Layers.

In addition to this, MAPublisher also provides its own tools for creating and managing artwork. **MAP Area Tools** are designed to draw rectangular and elliptical areas of specified dimensions in MAP Units.

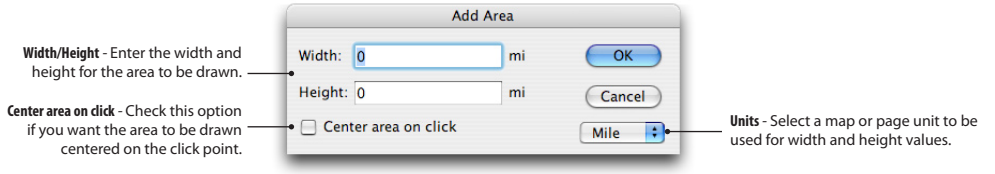
The **MAP Vector Crop Tool** will trim all the vector data (on all active layers) falling outside of a crop area.

The topics covered in this section are as follows:

MAP Area Tool
MAP Vector Crop Tool

MAP Area Tools

Tools > MAP Area Tool (Box) / *MAP Area Tool (Ellipse)*


Add Area
Width: 0 mi
Height: 0 mi
Center area on click
OK
Cancel
Mile
Width/Height - Enter the width and height for the area to be drawn.
Center area on click - Check this option if you want the area to be drawn centered on the click point.
Units - Select a map or page unit to be used for width and height values.

FUNCTIONALITY

By using the **MAP Area tools**, areas of exact map dimensions can be quickly added to any MAP Layer and its related attribute table. Whenever an area is created using the MAP Area tools, any objects that fall inside the area (in whole or part) will be automatically selected.

USING THE MAP AREA TOOLS

Overview

MAPublisher offers **Ellipse** and **Rectangle** drawing tools. Select the shape you require from the main Adobe Illustrator Toolbar, and select the MAP Layer which contains the coordinate system on which you want to draw the shape.

There are two methods of using the MAP Area tools. As with Adobe Illustrator shape tools you can either click and drag to create a shape at an unspecified size. Alternatively you can single click in the MAP document to open the **Add Area** dialog box, where you specify exact width and height values for the shape.

Drawing via Click and Drag

To draw shapes at unspecified sizes, click and drag over the Map document while holding down the left mouse button until the desired area has been outlined, as is done with the standard Adobe Illustrator area drawing tools. Use the **Alt** key (Windows) or the **Option** key (Mac) to draw from the centre and/or the **Shift** key to constrain the proportions. When you release the mouse button the area will be created.

Entering Specific Dimensions

To draw shapes at specified sizes, single click at a point in your Map document at the location from which you wish to plot the shape. The MAPublisher **Add Area** dialog box will appear into which you can enter specific dimensions for the area to be drawn. If you wish to have the area centered over the click point simply check the **Center area on click** box. If you do not check this box an area will be drawn from its upper left corner. Click **OK** to plot the shape.

RESULTS

Plotting a shape using either of these methods will initially select the features that fall, inside the area (in whole or part). Therefore, these tools can be also useful for selecting features that are within designated distances away from a central location.

MAP Vector Crop Tool

Tools > MAP Vector Crop

FUNCTIONALITY

By using the MAP Vector Crop Tool the entire map drawing (vector data) can be trimmed to a certain area of interest. Typically, the tool is meant to crop imported vector data that might be covering a larger area than the intended map extents. Used on a copy of the full original MAP View, MAP Vector Crop can also be utilized to create map insets (smaller maps centered on specific areas) - see example below.

PREREQUISITES

Before using the **MAP Vector Crop** tool, ensure that the layers to be trimmed are visible and unlocked in the Adobe Illustrator Layers panel. Similarly, layers that are not supposed to be cropped should be locked or invisible. The extent of the map that will remain after cropping must be visible on the screen**,** so make sure to zoom out sufficiently prior to starting the vector crop tool.

NOTE: Invisible and locked layers will not be cropped.

Users should save a copy of the Adobe document prior to performing a crop. Due to some Adobe Illustrator limitations, text typed on a path might not return to their prior state after an undo.

USING THE MAP VECTOR CROP

Click the **MAP Vector Crop** button in the Adobe Illustrator Tools panel, then click and drag a rectangle over the art-board. Upon release of the mouse button, the crop function is completed.

If the remaining map is too large, the MAP Vector Crop can be run again on the remaining data.
If the remaining map is too small, the MAP Vector Crop can be undone (menu *Edit* > *Undo*) and run again.

RESULTS

On all visible and unlocked layers:

- Text objects that have their anchor outside of the cropping rectangle are deleted.
- Points falling outside of the cropping rectangle are deleted (the position of the center of the symbol is relevant)
- Lines are clipped at the boundary of the cropping rectangle.
- Areas (polygons) that are completely out of the cropping rectangle are deleted. Areas intersecting with the cropping rectangle are clipped and closed following the edge of the rectangle.

The overall result is a map coverage reduced to the cropping rectangle outline. Subsequently, the MAP View(s) can still be transformed, rescaled etc. See examples on the next page.

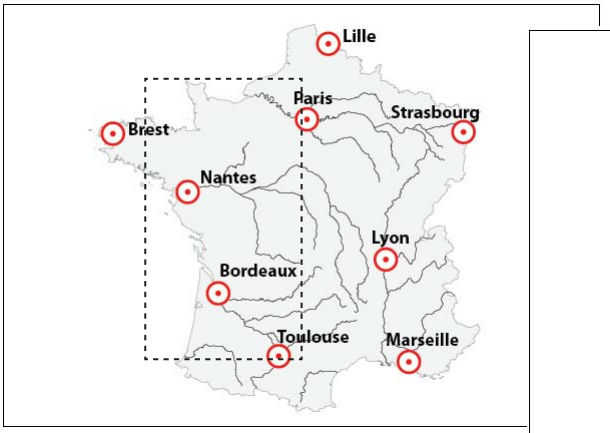
NOTE: The purpose of the MAP Vector Crop is to cut *vector* data types (points, lines and polygons). Some Adobe Illustrator specific objects might not be cropped properly using this tool, for example:

- Blend and Live Paint objects
- Any art using effects that have been rasterized.
- Custom art such as scale bars, grids/graticules, north arrows *(expand custom art to crop)*
- Images cannot be cropped with this tool.
- Legacy Text

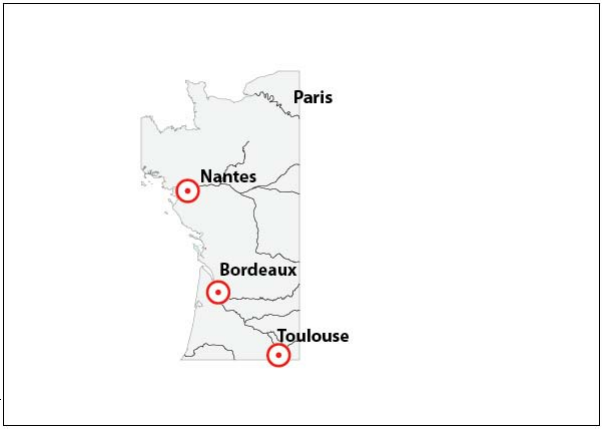
Due to an Adobe Illustrator limitation, text on a path might flip after a crop operation. This is corrected by checking the **Flip** option from **Type on the Path Options** dialog box started from the menu *Type* > *Type on a Path* > *Type on a Path Options*.

Examples:

Crop vector data



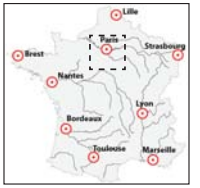
Original map



Crop result: lines and area are clipped, text with 1st letter within the cropping rectangle and symbol with center point in rectangle are maintained. The MAP view can be re-scaled to fit better to the document size

Create Inset

- Open a map, and make a copy (menu *File* > *Save a Copy*).
  Leave the original map open, make the copy the active document.
- Use MAP Vector Crop to crop the area of special interest.
- Make the original map active. In the MAP Views panel, select the option menu *Import MAP View from document*. Select the MAP View from the copy .

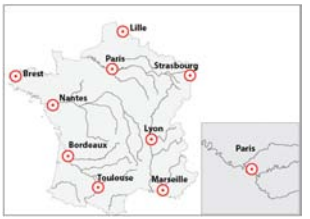


Original

The map now contains two MAP Views (at least). Their relative position can be managed from the MAP View Editor, as well as the scale of the inset map.

Copy and Crop

Edit MAP views: e.g. move inset and change scale



RESULT

Line Functions

MAPublisher contains several tools for working with map line segments.

As the graphics environment offers much more flexibility when working with vector artwork, MAPublisher offers graphics specific line tools, which will be discussed in detail in this chapter.

Buffer Lines allows for the creation of a buffer around current lines at designated distances in map units.

Flip Lines can be used to swap the start and end points of lines if these line strings were not originally digitized in a preferable manner.

Join Lines can be used to connect line segments into continuous line strings or compound paths based on a specified attribute column.

Simplify Lines allows for the removal of vertices from selected lines based on mathematical formulae.

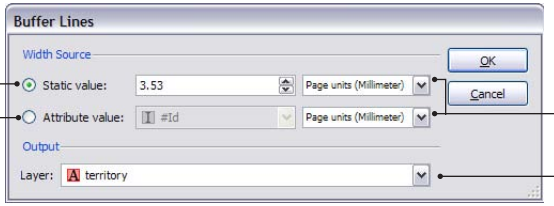
Join Points allows for point symbols to be joined based on attribute values. This tool will generate a line string joining common points, and is ideal for GPS data.

Topics covered in this section are:

Buffer Lines
Flip Lines
Join Lines
Join Points
Simplify Lines

Buffer Lines

*Filter > MAP Lines > Buffer Lines** or *MAP Toolbar*



Static Value - If you want to enter a specific value to buffer the selected lines by, click this option and enter the value in the adjacent entry field.

Attribute Value - If your line data has a column in its attribute table that contains buffering values, click this option and select the column containing the value.

Units - Select a unit to use for the buffer values. The default is the current map unit.

Output Layer- Select the Area layer which will hold the buffered objects.

FUNCTIONALITY

The MAPublisher **Buffer Lines** filter creates buffer Area objects around the line work. This can be useful if you are attempting to calculate distances on each side of a line. An example where you would use this tool could be in the planning of new roads, where the actual width of the highway is a major consideration.

PREREQUISITES

Your MAP Layer must be a **Line layer** to use Buffer Lines.

Before using this filter you must create an **Area layer** in your Adobe Illustrator Layers panel. Create a new layer, and then drag this to the MAP View which holds line work you wish to buffer, remembering to set the feature type to Area. To use this tool, select the line(s) you wish to buffer, and then go to *Filter > MAP Lines > Buffer Lines* or use the MAPublisher toolbar button .

USING BUFFER LINES

You can choose to buffer lines by entering a value or by selecting an attribute column that contains buffer values. The buffering value specified designates the total width of the new area object. For example, a value of 10 map units would create a buffer of 5 map units on either side of the selected line. This works on individual lines or a selected set of lines. The buffer width will be calculated and created using the units of measurement set in the dialog box.

1. Set the unit to use for the buffer value from the **Units** drop-down list.
2. Then choose which option to use for the buffer values. When the Buffer Lines filter is run with the **Attribute Value** option checked, an area width is calculated based on the value(s) related to the selected object(s) in the attribute table. The area will then be constructed based on the line's attribute value. When the filter based is run based on a **Static Value**, an area object is created by the specified value.
3. Choose the **Area layer** to place the buffer(s), then click **OK** to generate the areas.

** In Adobe Illustrator CS4, Buffer Lines is found in the Object > Filters > MAP Lines menu.*

Flip Lines

*Filter > MAP Lines > Flip Lines** or *MAP Toolbar*

FUNCTIONALITY

The MAPublisher **Flip Lines** filter reverses the endpoints of a line or an area (open or closed path).

Adobe Illustrator *Brushes* and *Type on a Path* tools are designed to position patterns and text depending on the direction of the endpoints. Two consequences of this are:

- Cases occur when labels are placed upside down and backward when using the MAPublisher labelling tools (*MAP Tagger* tool and *Feature Text Label,* see chapter 10 Labelling Functions).
- When applying graphic styles with a brush pattern to paths (manually or using MAPublisher *MAP Stylesheets*), sometimes patterns are not applied at the right side of the line or in the expected orientation.

In order for the labels or patterns to be consistent for a group of lines, flipping some of the lines may be necessary.

Lines can be flipped on **Line layers** and **Area layers**. In order to use this filter, select the lines to be flipped, and then go to *Filter > MAP Lines > Flip Lines*, or use the MAPublisher toolbar button .

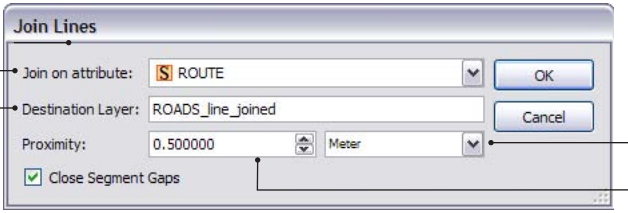
NOTES:

- When exporting Area layers to GIS formats, polygon outlines must have a positive #Area value in the MAP Attributes panel. If some values in the #Area column are negative (and #AreaDirection is equal to *Counter Clockwise*), **Flip Lines** can then be used to reverse the #AreaDirection and convert the #Area to a positive value.
- For compound paths, the #AreaDirection property is equal to *Indeterminate*, therefore compound paths cannot be flipped.
- The MAPublisher *MAP Tagger* tool or *Feature Text Label*, have an option to enable **Flip upside-down labels** to create text in a consistent orientation, without requiring the use of the Flip Lines function (see chapter 10 for details).

** In Adobe Illustrator CS4, Flip Lines is found in the Object > Filters > MAP Lines menu.*

Join Lines

*Filter > MAP Lines > Join Lines** or *MAP Toolbar*



Join on Attribute - Select the column you wish to base the join on. All lines within the selected proximity with matching column values will be joined.

Destination Layer - Enter the name of the output layer. This new layer will contain the newly joined lines.

Proximity Units - Select a map or page unit to be used for proximity values.

Proximity - Assign a proximity value in the current unit. This value determines how close together (in map units) the lines must be in order to be joined.

Close Segment Gaps - If two line segments are separated by a distance less than the Proximity, selecting this option will create a line segment that connects the two lines otherwise a compound path is created.

FUNCTIONALITY

The **Join Lines** filter allows a group of linear features to be joined based on a common value within an attribute column. For example, it may be desirable to join all segments of a particular street by the common attribute of street name in order to create a single line element representing that street. When the Join Lines filter is run a new layer is created containing the joined lines in order to avoid deleting other attributes within the original street layer. The new MAP Layer contains the joined lines with an attribute column representing the joined column.

Join Lines can be very useful for reducing the size of a data file by joining related lines and thus reducing the number of segments and associated data present in the file. It is also very useful to run Join Lines prior to labelling with **Feature Text Label** in order to reduce the occurrence of duplicate labels (see chapter 10 *Labelling Functions*).

PREREQUISITES

This tool can be executed on selections on **Line layers**. To access Join Lines, go to *Filter > MAP Lines > Join Lines* or use the MAPublisher toolbar button .

USING JOIN LINES

In the **Join on attribute** drop-down list, select the attribute column containing the attributes you wish to join. For example to join lines based on street name, you should select the column containing the street names. This will result in line segments containing the same street name being joined.

In the **Destination Layer** text box you should specify a name for the new **Line layer** that MAPublisher will create to hold your joined lines.

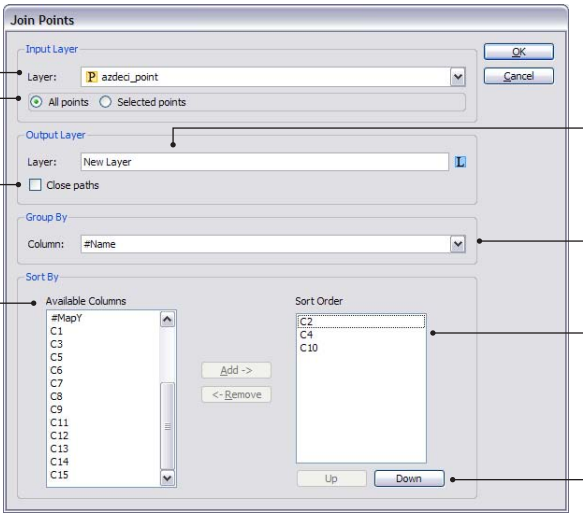
A **Proximity** value should be entered and Proximity **Units** assigned. Units can be specified in map units or page units. Entering a proximity value of zero will only join line segments that are touching. If the distance between the end of a segment and the start of another is greater than the proximity value you enter, these lines will not be joined. If two line segments in the selection are separated by a distance less than the set proximity value, check the **Close Segment Gaps** option to create a line segment that connects the two lines. When not selected a compound path will be created.

When you have entered your preferences for the join click **OK**. On the newly created Line layer view the layer's attributes in the **MAP Attributes** panel. Note that the only attribute columns present are the default #Property columns and the attribute column you specified for your join.

** In Adobe Illustrator CS4, Join Lines is found in the Object > Filters > MAP Lines menu.*

Join Points

Filter > MAP Lines > Join Points or MAP Toolbar*



Input Layer - Use this drop-down list to select the Point layer containing the symbols you wish to join.

All Points / Selected Points - You can choose to join only those points that have been selected or all points on the selected MAP Layer.

Close paths - Check this option to generate an Area layer. If unchecked, a Line layer will be generated.

Sort By Available Columns - Select an attribute column containing ascending values to sort by. Then click the Add button to add the column to the Sort Order.

Output Layer - Enter the name of the output layer. This new layer will contain the generated lines.

Group By - Specify the attribute column containing similar values to determine each group of points.

Sort Order - Contains a hierarchical list of the columns specified to sort by. To remove a column from the Sort Order, click the Remove button.

Move Up / Move Down - You can move columns up and down the Sort Order hierarchy by clicking the appropriate button .

FUNCTIONALITY

The **Join Points** filter allows a group of point symbols to be joined to form a line, based upon sorting criteria which exist in the attribute structure of the point layer. For example, it may be desirable to join points that were originally generated by a GPS device, in order to create line elements connecting these points. When the Join Points filter is run a new layer is created containing a line linking each set of common points, with the generated layer containing the same common attribute column that was used to group the points together.

PREREQUISITES

Join Points can only function on **Point** layers, and can be used on both currently selected point symbols or all the point symbols on a specified layer. There must be at least two attribute columns on the specified point layer in order to use Join Points. To open the dialog box, go to *Filter > MAP Lines > Join Points* or MAPublisher toolbar button .

USING JOIN POINTS

From the **Input Layer** drop-down list, select the **Point layer** containing the points you wish to join. Then specify if you wish to join **All Points**, or just the **Selected Points** on this layer, by selecting the appropriate option.

Specify a name for the **Output Layer** that this function will generate. By default, the program will generate a **Line** layer. To generate an **Area** layer (by linking the line end to the start) check the **Close paths** option.

In the **Group By Column** drop-down list, select the attribute column containing the common attributes you wish to join together. For example to join points based on a unique ID, you should select the column containing the common ID names. This will result in point symbols containing the same name being joined together.

** In Adobe Illustrator CS4, Join Points is found in the Object > Filters > MAP Lines menu.*

As each point that is joined will be represented by a node in a line string, you must now specify a logical order by which the points will be joined. For example, it is logical that the point which was captured by a GPS unit first should be the first node in the line string, with the second and third points being located at the second and third nodes. In order to specify these parameters, choose columns by which to sort your points. These should be attribute columns which contain rising alphabetical or numerical values.

In the **Sort By Available Columns** list, select the primary sorting column. This should be the attribute column that contains the best fit for rising alphabetical or numerical values. For example if points have rising values from 1–10, the point with a value equal to 1 will be at the start of the generated line, and the point with a value equal to 10 will be at the end of the line. When you have selected the column, click the **Add** button to place the column into the **Sort Order** list. If all the values contained in the first *Sort By* column are unique, you will not be required to set a secondary column.

If the first *Sort By* column contained any similar values, you must specify a secondary column. Again click a column in the **Sort By Available Columns** list, and then click the **Add** button to place the column in the **Sort Order** list. Similarly third, fourth and fifth *Sort By* columns can be specified in the same manner if previous columns contain similar values. Note that the *Sort By* columns are a hierarchy with the topmost specified column being used for the primary sort, then the second, then third, etc.

To move columns up or down the hierarchy after they have been specified, simply select the appropriate column in the Sort Order list and click either the **Up** or **Down** button.

To remove any *Sort By* columns from the hierarchy, select the column in the **Sort Order** list and click the **Remove** button.

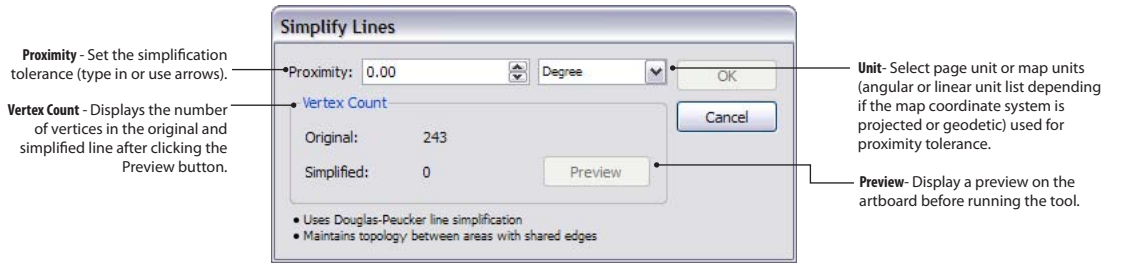
Note that a maximum of five columns can be used to sort points into a logical order. If the columns specified to sort by do not distinguish an ordering between certain points, the order of these points in the attribute table will be used to determine the order of the nodes in the generated line string.

RESULTS

When all the options have been set click **OK** to join the points on the specified layer. An **Area** or **Line** layer will be generated, depending on the specified output layer type, which will be placed in the same MAP View as the Input Point layer which has been joined.

Simplify Lines

*Filter > MAP Lines > Simplify Lines** or *MAP Toolbar*


Proximity - Set the simplification tolerance (type in or use arrows).
Vertex Count - Displays the number of vertices in the original and simplified line after clicking the Preview button.
Simplify Lines
Proximity: 0.00
Degree
OK
Cancel
Vertex Count
Original: 243
Simplified: 0
Preview
• Uses Douglas-Peucker line simplification
• Maintains topology between areas with shared edges
Unit- Select page unit or map units (angular or linear unit list depending if the map coordinate system is projected or geodetic) used for proximity tolerance.
Preview- Display a preview on the artboard before running the tool.

FUNCTIONALITY

The MAPublisher **Simplify Lines** filter allows for the simplification or generalization of imported vector data. The Simplify Lines function uses the popular Douglas-Peucker algorithm for removing nodes and vertices during simplification. For more information on the Douglas-Peucker algorithm see page A1/36.

Simplify Lines is used to reduce the number of points required to represent a vector-encoded line where the lines are approximated by a stream of X-Y coordinates. The function can be used on **Line** or **Area** layers and removes nodes based upon a proximity value in either **Page Units** or **Map Units**. The list of **Map Units** depends on the MAP View coordinate system - e.g. angular units (page units, degrees, etc) for geodetic coordinate systems; linear units (such as metre, feet) for projected coordinate systems.

The **Proximity value** or simplification tolerance is based on the vertical difference between the begin-end line and points off a line, NOT the distance between anchor points on the line. The Douglas-Peucker algorithm takes the proximity value and iterates through the line vertices to determine the points that fall within the specified proximity distance off the line and removes those vertices. Once all vertices are determined to be greater than the proximity value the line processing ends. A smaller proximity value will usually result in a fewer number of nodes being removed.

USING SIMPLIFY LINES

To access the function click the menu *Filter > MAP Lines > Simplify Lines* or the MAPublisher toolbar button . Enter a proximity value in **Page Units** or **Map Units** by making a selection from the **Units** drop-down list. Page Units will be simply the units of the current document. Enter a proximity value in the unit specified by typing a value or by using the arrows.

Click the **Preview** button to see the simplification result. Once the result is correct, click **OK** to perform the actual simplification. It is always a good idea to experiment with different proximity values in order to achieve the desired results particular to your scale and coverage area.

** In Adobe Illustrator CS4, Simplify Lines is found in the Object > Filters > MAP Lines menu.*

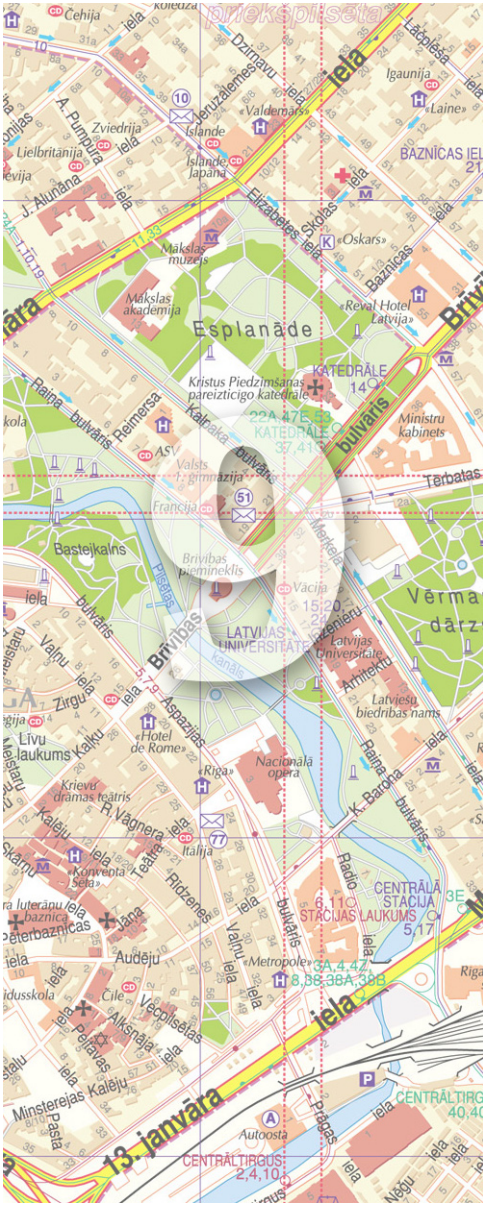
RESULTS

All selected lines or areas are simplified according to the settings. Simplified lines or areas will not be simplified again unless the tolerance value is increased. For example, if a line has been simplified with a proximity of 1.5 km., then it will not be simplified again until the tolerance is set to a value larger than 1.5 km.

In practice, it means that simplified lines can be selected again with non-simplified lines to run the function again, when the **Simplify Lines** function is run only the new lines will be simplified (unless the proximity value is increased).

NOTES:

- It is a good idea to perform simplify lines on artwork before exporting a Flash map. This will reduce the size of the file and therefore it will have a faster rendering time.
- To smooth the appearance of paths using Bezier curves, use the Adobe Illustrator function **Simplify Lines** found in the menu *Object* > *Path* > *Simplify*.



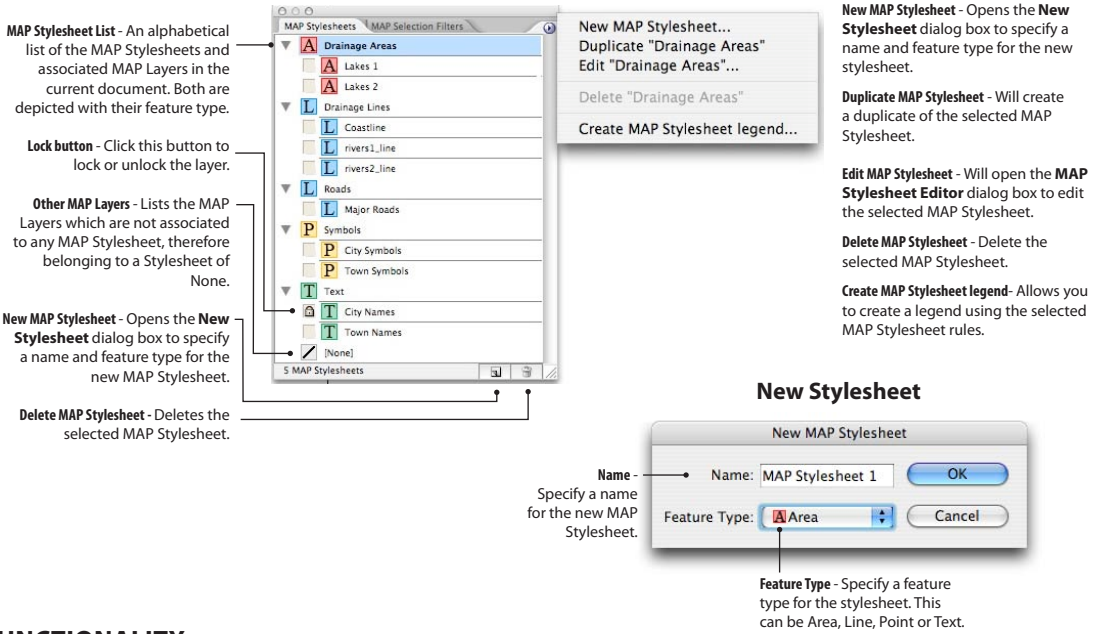
MAP Stylesheets

MAPublisher provides extensive tools for quick, easy and accurate styling of points, lines, areas and text. This function is able to read and work with the data found in the MAP Attributes panel and to apply symbols, graphic styles and character styles to artwork according to the legend criteria you specify.

The topics covered in this section are as follows:
MAP Stylesheets Panel
MAP Stylesheet Editor

MAP Stylesheets Panel

Window > *MAPublisher* > *MAP Stylesheets* or *MAP Toolbar*


MAP Stylesheet List - An alphabetical list of the MAP Stylesheets and associated MAP Layers in the current document. Both are depicted with their feature type.
Lock button - Click this button to lock or unlock the layer.
Other MAP Layers - Lists the MAP Layers which are not associated to any MAP Stylesheet, therefore belonging to a Stylesheet of None.
New MAP Stylesheet - Opens the New Stylesheet dialog box to specify a name and feature type for the new MAP Stylesheet.
Delete MAP Stylesheet - Deletes the selected MAP Stylesheet.
MAP Stylesheets
MAP Selection Filters
Drainage Areas
Lakes 1
Lakes 2
Drainage Lines
Coastline
rivers1_line
rivers2_line
Roads
Major Roads
Symbols
City Symbols
Town Symbols
Text
City Names
Town Names
[None]
5 MAP Stylesheets
New MAP Stylesheet...
Duplicate "Drainage Areas"
Edit "Drainage Areas"...
Delete "Drainage Areas"
Create MAP Stylesheet legend...
Options Menu...
New MAP Stylesheet - Opens the New Stylesheet dialog box to specify a name and feature type for the new stylesheet.
Duplicate MAP Stylesheet - Will create a duplicate of the selected MAP Stylesheet.
Edit MAP Stylesheet - Will open the MAP Stylesheet Editor dialog box to edit the selected MAP Stylesheet.
Delete MAP Stylesheet - Delete the selected MAP Stylesheet.
Create MAP Stylesheet legend- Allows you to create a legend using the selected MAP Stylesheet rules.
New Stylesheet
New MAP Stylesheet
Name - Specify a name for the new MAP Stylesheet.
Name: MAP Stylesheet 1
OK
Feature Type: Area
Cancel
Feature Type - Specify a feature type for the stylesheet. This can be Area, Line, Point or Text.

FUNCTIONALITY

MAP Stylesheets allow you to quickly create and apply legends (or expression rules) based on MAP Attributes using symbols, graphic styles, and character styles that exist in the respective Adobe Illustrator panels. Stylesheets are created using specific values contained in the MAP Attributes panel for the related MAP Layer assigned to the MAP Stylesheet and then stylized using Adobe Illustrator symbology, graphic styles or character style. MAP Stylesheets can be applied to data on both a one to one basis, where specific attribute values are assigned with a specific style or symbol (i.e. Style 1 = Value A) or with attribute value ranges (i.e. Style 2 = Greater than Value B and Less than Value C). Stylesheet information will be saved in the Adobe Illustrator file so that the MAP Stylesheet can be quickly edited later.

USING THE MAP STYLESHEETS PANEL

This panel is the starting point for working with MAP Stylesheets, and is opened by going to *Window* > *MAPublisher Panels* > *MAP Stylesheets* or through the MAPublisher toolbar button .

The MAP Stylesheets panel contains a list of all MAP Layers. Similar to *MAP Views*, the icons used for these layers are:

Area Layer

Line Layer

Point Layer

Text Layer

By default all MAP Layers will be listed as not belonging to a stylesheet— [No MAP Stylesheet]. When a new MAP Stylesheet is created, drag a MAP Layer into it. This will load its attributes for creating legend rules or expressions.

Loading Symbols and Styles

The symbology used by MAP Stylesheets is directly related to the symbols and styles which exist in native Adobe Illustrator panels. In order to correctly function, the MAP Stylesheet requires that symbology or styles appropriate to the feature type is established in the following Adobe Illustrator panels:

A Area Stylesheets:	**Graphic Styles** *panel (Window > Graphic Styles)*
L Line Stylesheets:	**Graphic Styles** *panel (Window > Graphic Styles)*
P Point Stylesheets:	**Symbols** *panel (Window > Symbols)*
T Text Stylesheets:	**Character Styles** *panel (Window > Type > Character Styles)*

Symbology can be quickly added to these panels by dragging and dropping artwork from the artboard, or by dragging and dropping symbology from custom libraries.

As an example under *Window > Graphic Style Libraries > Other Library…* navigate to the *Helpful Styles & Symbols Files* folder (see Appendix 4) on your MAPublisher CD and load either *MAP_AreaStyles.ai* or *MAP_LineStyles.ai*. Then shift-select these styles and drag them into the *Graphic Styles* panel for use in Area and Line Stylesheets.

Similarly you can navigate to *Window > Symbol Libraries > Other Library…* and load *MAP_PointSymbols.ai*. Then shift-select these symbols and drag them into the *Symbols* panel for use in Point Stylesheets.

NOTE: An Adobe Illustrator file will save all the symbols, graphic styles and character styles created. Create a master file with all your symbols, graphic styles and character styles for easy reference when adding these elements for MAP Stylesheet creation.

Creating a New Stylesheet

To create new MAP Stylesheets you must first select **New MAP Stylesheet…** under the **Options** menu, or click the **New** button at the base of the panel. This will open the **New Stylesheet** function, where you are required to specify the name and feature type for the new MAP Stylesheet. Clicking **OK** will place the new stylesheet in the panel and assign it with the appropriate icon. It is possible to now drag single or multiple **MAP Layers** with a matching feature type into this stylesheet. If your data is held across a number of layers, all of these layers can be placed inside the same stylesheet.. Note that they do not need to contain the same attribute structures. As long as they are all of a matching feature type they can be placed inside one MAP Stylesheet.

Deleting and Duplicating Stylesheets

You can create as many MAP Stylesheets as you wish within a document. Note that in the MAP Stylesheets panel options menu there are functions to delete and duplicate stylesheets.

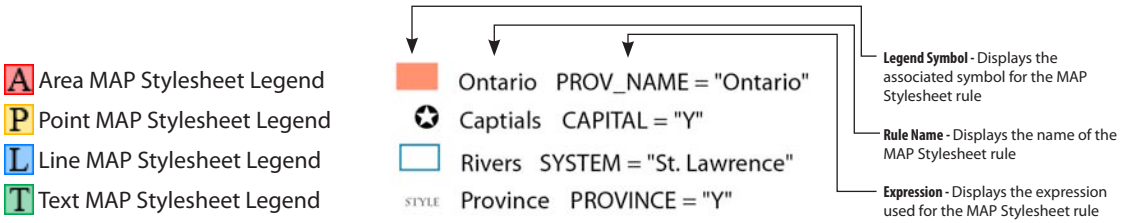
Selected MAP Stylesheets may be deleted by clicking the **Delete** button at the base of the panel or by selecting **Delete Stylesheet** in the panel options menu. In order to delete a stylesheet, you must first drag associated MAP Layer(s)

out of the stylesheet, such as into [No MAP Stylesheet] or into another stylesheet. Only at this stage will the Delete option be activated. Note that moving a stylesheet to [No MAP Stylesheet] will not restore the data to its default symbology; it will simply remove the relationship between attribute value and style/symbol.

Duplicate Stylesheet can be used to create copies of existing stylesheets. Even though the copy will not contain a MAP Layer at first, the style rules which exist between attributes of the original layer and the symbology will be retained. Simply by editing the styles that relate to each value in each stylesheet, you can drag a MAP Layer from one MAP Stylesheet to another in order to output different versions of a map.

Creating a MAP Stylesheet Legend

A legend can be quickly created using any MAP Stylesheet. Any area, line, point or text MAP Stylesheets can be used for a legend. The legend is created by drawing an area, line, point symbol or displaying the word *Style* (using the character style set by the rule) followed by the expression associated with that MAP Stylesheet rule.

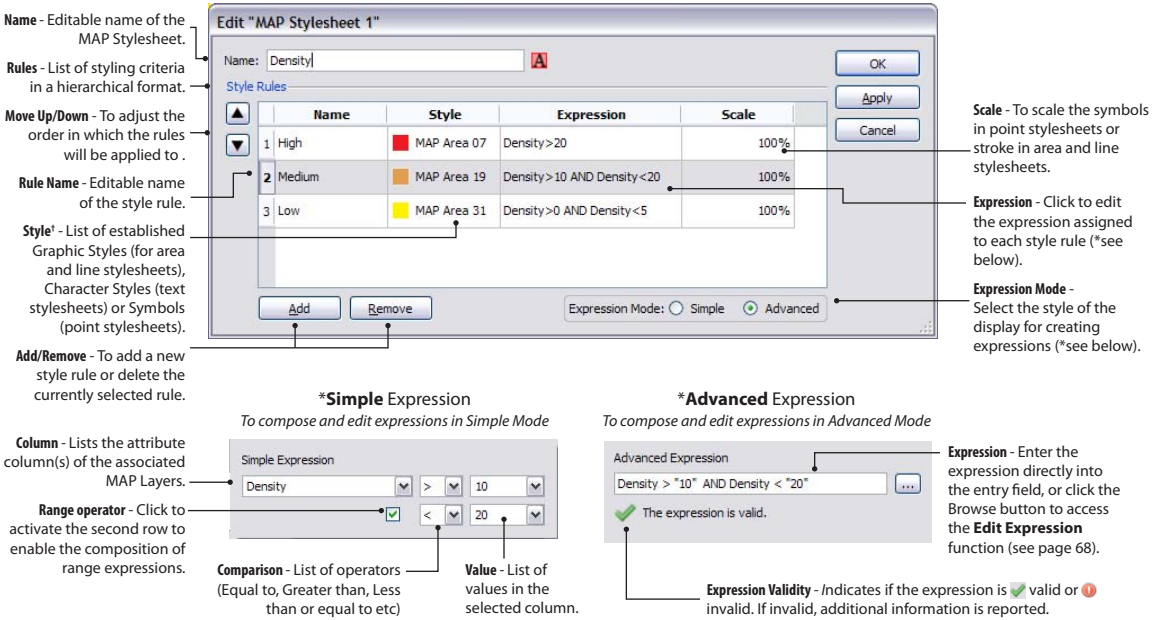

A Area MAP Stylesheet Legend
P Point MAP Stylesheet Legend
L Line MAP Stylesheet Legend
T Text MAP Stylesheet Legend
Ontario PROV_NAME = "Ontario"
Captials CAPITAL = "Y"
Rivers SYSTEM = "St. Lawrence"
STYLE Province PROVINCE = "Y"
Legend Symbol - Displays the associated symbol for the MAP Stylesheet rule
Rule Name - Displays the name of the MAP Stylesheet rule
Expression - Displays the expression used for the MAP Stylesheet rule

To create a legend using MAP Stylesheets you must first create a **Legend layer**. Create a layer in the Adobe Illustrator layers panel, drag the layer to a MAP View and define the layer as a **Legend layer**. Then select the MAP Stylesheet that you would like to use to create the legend. In the panel options menu, select **Create MAP Stylesheet legend**.

The legend's font is set by the character panel. Select the font you would like to use for your legend using the character panel before creating a MAP Stylesheet Legend. Legends are fully customizable. If you would like to change any aspect of the legend this is can easily be accomplished. Select your legend and use Adobe Illustrator *Object > Ungroup*. The legend is now Illustrator artwork allowing you freedom to edit individual elements.

MAP Stylesheet Editor

MAP Stylesheets panel > Edit


Name - Editable name of the MAP Stylesheet.
Rules - List of styling criteria in a hierarchical format.
Move Up/Down - To adjust the order in which the rules will be applied to .
Rule Name - Editable name of the style rule.
Style† - List of established Graphic Styles (for area and line stylesheets), Character Styles (text stylesheets) or Symbols (point stylesheets).
Add/Remove - To add a new style rule or delete the currently selected rule.
Edit "MAP Stylesheet 1"
Name: Density
OK
Apply
Cancel
Style Rules
Name
Style
Expression
Scale
1 High
MAP Area 07
Density>20
100%
2 Medium
MAP Area 19
Density>10 AND Density<20
100%
3 Low
MAP Area 31
Density>0 AND Density<5
100%
Add
Remove
Expression Mode: Simple Advanced
Scale - To scale the symbols in point stylesheets or stroke in area and line stylesheets.
Expression - Click to edit the expression assigned to each style rule (*see below).
Expression Mode - Select the style of the display for creating expressions (*see below).

*__Simple__ Expression

To compose and edit expressions in Simple Mode

Column - Lists the attribute column(s) of the associated MAP Layers.

Range operator - Click to activate the second row to enable the composition of range expressions.

Comparison - List of operators (Equal to, Greater than, Less than or equal to etc)

Value - List of values in the selected column.

*__Advanced__ Expression

To compose and edit expressions in Advanced Mode

Expression - Enter the expression directly into the entry field, or click the Browse button to access the **Edit Expression** function (see page 68).

Expression Validity - Indicates if the expression is valid or invalid. If invalid, additional information is reported.

† *For Text stylesheets, if the* **Style** *list does not contain a recently created character style, simply return to the Character Style panel, double-click this style and click OK in the Character Style Options dialog box. This forces Adobe Illustrator to re-load the list of character styles.*

FUNCTIONALITY

Accessing the MAP Stylesheet Editor

When you have a MAP Stylesheet created which hosts at least one MAP Layer of the same type, click the stylesheet name, and go to *Options* > *Edit…* Alternatively *double-click* the new MAP Stylesheet.

The **Name** of the current MAP Stylesheet will be displayed at the top of this dialog box, which is editable. Also a feature type icon will be displayed. To begin, click the **Add** button to create elements in your MAP Stylesheet.

Assigning a Style Rule Name

The Style Rule **Name** column will contain the name of each style rule. This can be edited to describe the style rule and/or its intention. For example, style rules could be named "Roads" or "Cities with populations over 200,000".

Selecting Styles and Symbols

The **Style** field will contain a list of styles that currently exist in the Adobe Illustrator **Graphic Styles** panel (for Area and Line stylesheets), in the **Symbols** panel (for Point stylesheets), or in the **Character Styles** panel (for Text stylesheets). For each rule, choose a style or symbol to use. Note you can only use a specified style once in a single stylesheet. The **Move Up** and **Move Down** buttons will move the priority of the selected style up or down the list.

Assigning an Expression

The Expression field describes the criteria for applying the style rule. By default, the field displays the currently entered expression, if any. Clicking the *Expression* field opens either the **Simple Expression** panel or the **Advanced Expression** panel, depending on the **Expression Mode** and the current expression (see page 68).

To choose the mode in which to compose your expression, select the **Simple** or **Advanced** option. Then assign an expression for each rule using the guidelines below.

Simple Expressions...

The Simple Expression panel is intended to facilitate quick expression generation. First, select a column from the drop-down list, or manually type in a name.

Choose a **Comparison**. There are six options available:

=	*Equal to*	**>=**	*Greater than or equal to*
>	*Greater than*	**<=**	*Less than or equal to*
<	*Less than*	**!=**	*Not equal to*

Select the **Value** against which the comparison will be applied. You can select the value from the drop-down list or enter the value manually. Similarly, the value does not have to appear in the list to be valid.

If you chose any *Comparison* except *Equal to, (=),* you then have the option of extending your expression further. Clicking the **Range operator** check box enables an additional **Comparison** and **Value** input pair. As with the first set, you must pick a Comparison and a Value, thus completing your expression.

If you enter an expression with *Equal to* (e.g. *Attribute1 = A*), when you select this rule again and click the **Add** button, the new expression will be automatically written using the same attribute *Equal to* the next value on the list (e.g. *attribute1 = B*). This does not occur with the other operators.

Advanced Expressions...

The Advanced Expression panel lets you construct more complex expressions.

Enter a valid expression in the Expression field. The **Expression Validity** icon will report if the expression entered is valid. Otherwise it will report and include additional warning notes. Alternatively click on the **Browse** button to enter and edit expressions via the **Edit Expression** tool (see chapter 5).

The following are some examples of basic expressions which can be entered for styling rules.
NAME = "Ontario"
Result: All items with the value "Ontario" in the NAME column are assigned the selected style.

POPULATION < 1000000
Result: All items with values less than one million in the POPULATION column are assigned the selected style.

NAME = "Ontario" OR NAME = "Alberta"
Result: All items with the value "Ontario" OR "Alberta" in the NAME column are assigned the selected style.

NAME = "Ontario" AND POPULATION < 1000000
Result: Only items containing the value "Ontario" in the NAME column AND values less than one million in the POPULATION column are assigned the selected style.

NOTE: String values are case-sensitive and must be entered between double quotes ("...").

Assigning a Scale

The **Scale** default is 100%. Editing the scale will alter the symbol size (points) or stroke weight (areas and lines).

Building the Stylesheet

For subsequent style rules proceed in the same manner. Click **Add**, and then specify a **Name**, **Style**, **Expression** and **Scale**. You can click **Apply** at any time to preview the results at any stage of building a stylesheet, and also return to edit settings you have made for individual style rules. In order to delete a style rule from the list, click anywhere in its row and click the **Remove** button.

Click **OK** to exit the dialog box and to assign the MAP Stylesheet to the associated MAP Layers.

IMPORTANT NOTES

Expression Modes

The **Expression Mode** determines which type of expression panel you get when editing a style rule's expression The expression mode will be remembered from the last session.

If the *Expression Mode* is set to **Advanced**, the expression panel will always be the Advanced Expression panel, irrespective of the expression being edited. If the *Expression Mode* is set to **Simple**, the expression panel will be the Simple Expression panel, unless the expression to be edited is not a simple expression. A *Simple Expression* is one that is either empty or includes only one attribute and no more then two clauses. For example:

Simple Expression: AttributeA = 1
Simple Expression: AttributeB < 5 AND AttributeB > 1
Advanced Expression: AttributeC > 1 AND AttributeD > 10

If the current expression is not a *Simple Expression*, editing it will always result in the *Advanced Expression* panel.

Dynamic Style Linkage

Once a MAP Stylesheet has been assigned with styles and symbols, those styles and symbols are dynamically linked to their attribute values in the MAP Stylesheet if the expression is a simple equality.

A simple equality expression is when there is only one attribute and only one clause (an equality comparison). For example *AttributeA=1* is a simple equality expression, while *AttributeA > 15* is not.

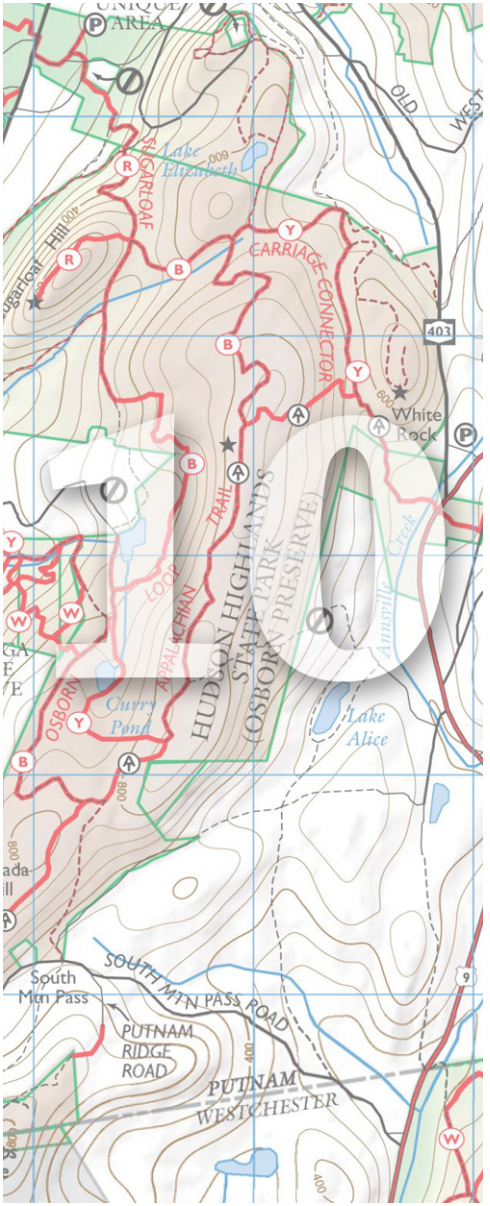
Applying the style from a style rule with a simple equality expression manually (i.e. changing a style of a polygon directly from the *Graphic Styles* panel) will assign the attribute value of that style rule in the MAP Stylesheet. For example, in the case above *AttributeA* on the modified art would be set to **1**. Caution should be used with manually editing the styles of artwork after MAP Stylesheets have been applied if any style rules have simple equalities.

Similarly, as styles and symbols which exist in these Adobe Illustrator panels are linked to the related MAP Stylesheet entries, using these styles and symbols to create new artwork will automatically assign the related attribute value to these objects when the same criteria are met.

Point Data

Regarding the editing of **Point Data**, you must use either MAP Stylesheets or the MAP Attributes panel to change symbology. As point data is linked dynamically to the symbols which exist in the Symbols panel, you cannot edit graphical properties manually. Choosing *Break Link to Symbol* from the Symbols panel options will result in the loss of attributes for your point data.

NOTE: MAP Stylesheet can be quickly created when using equality operators. If the first rule created is Capital = "Y" by clicking *Add* the next rule will be created using the next unique attribute value Capital = "N". Creating rules like this will use the next graphic style in the *Style* column. Symbols, graphic styles and characters styles will be displayed alphabetically in the *Style* column. Unique attribute values will be displayed alphabetically and numerically when creating expression rules. Therefore when creating a map that requires a style for each unique attribute value create the first rule and click *Add* to auto-populate the next rule.



Labelling Functions

One of the most useful features of MAPublisher is the ability to create labels for map objects using values from the MAP Attributes panel. Manually entering and placing labels is not necessary, provided that the labelling information is included in the map attributes of the MAP Layer being labelled.

MAPublisher provides two methods of adding labels to your map, both of which contain options to place labels intelligently using defined label settings.

One way to create feature labels is to first select all the features you want to be labelled and use **Feature Text Label** to label all of them by specified attribute values.

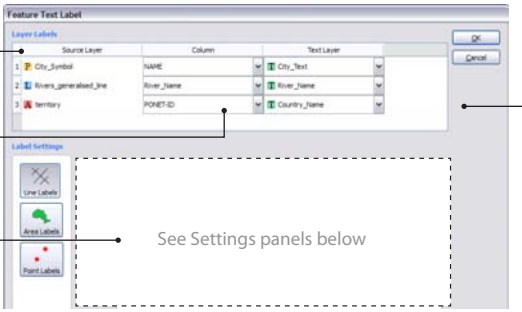
An alternate method involves using the **MAP Tagger Tool** to apply labels individually, also by specified attribute values.

Topics covered in this section are:

Feature Text Label
MAP Tagger Tool

Labelling Tools

For Feature Text Label and MAP Tagger Tool



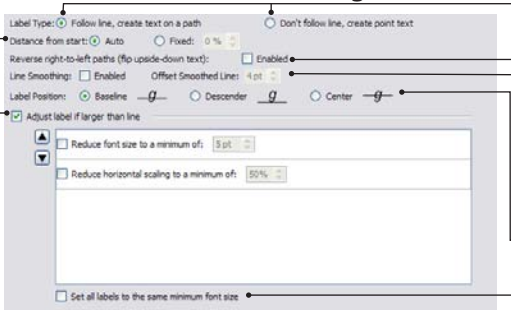
Source Layer - Lists the Point, Line and Area layers which can be labelled. For Feature Text Label, only layers containing selected items are listed.

Source Column - Select the column that contains the values you wish to use to label the selected features.

Label Settings - Click the appropriate button to assign label settings and rules for each layer type (see below).

Text layer - For each Source Layer, select the destination text layer you wish to place the generated text labels on.

Line Label Settings


Label Type: Follow line, create text on a path
Don't follow line, create point text
Distance from start: Auto
Fixed:
Reverse right-to-left paths (flip upside-down text):
Enabled
Line Smoothing:
Enabled
Offset Smoothed Line:
Label Position: Baseline
Descender
Center
Adjust label if larger than line
Reduce font size to a minimum of:
Reduce horizontal scaling to a minimum of:
Set all labels to the same minimum font size

Distance from start - Controls where the text is located along the line.
Auto - will place text at the midpoint for straight lines and find the smoothest portion closest to the midpoint for curved lines.
Fixed - will allow for precise placement of text along a line.

Adjust label if larger than line - Specify rules for the scaling of text if the text will not fit onto the text path in its entirety.
Click the Up or Down buttons to adjust the order in which the rules will be implemented in the labelling process.

Follow/Don't Follow Line - Select whether text should follow paths or be placed at a point near the selected line.

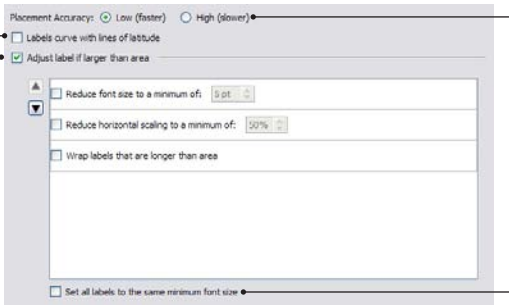
Flip upside-down labels - By default this is always enabled and will automatically orient labels correctly. Disabling this feature will not flip label.

Line Smoothing / Offset Line - Check to smooth the generated text path. Then specify an offset distance for the text path from the original.

Label Position - Choose how the text will be placed on the generated text path.

Set all labels to same minimum size - If at least one label has been reduced in font size due to the implementation of rules, then ALL text items will be reduced to that font size (in Feature Text Label only).

Area Label Settings


Placement Accuracy: Low (faster)
High (slower)
Labels curve with lines of latitude
Adjust label if larger than area
Reduce font size to a minimum of:
Reduce horizontal scaling to a minimum of:
Wrap labels that are longer than area
Set all labels to the same minimum font size

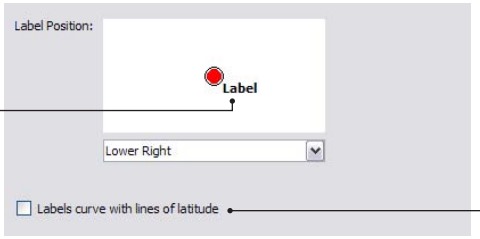
Labels curve with lines of latitude -
For projected layers, choose this option to generate curved text on latitude lines.

Adjust label if larger than line - Specify rules for the scaling of text if the text will not fit inside the area object in its entirety.
Click the Up or Down buttons to adjust the order in which the rules will be implemented in the labelling process.

Placement Accuracy - If you require area labels to be placed with high precision in the centre of area objects, choose High. To quickly generate labels, choose Low.

Set all labels to same minimum size - If at least one label has been reduced in font size due to the implementation of rules, then ALL text items will be reduced to that font size (Feature Text Label only).

Point Label Settings



Label Position - Choose the position of the label relative to the point symbol.

Labels curve with lines of latitude -
For projected layers, choose this option to generate curved text on latitude lines.

Feature Text Label

*Filter > MAP Legend > Feature Text Label** or *MAP Toolbar*

FUNCTIONALITY

The Feature Text Label filter allows labels to be added to your map based on the attribute data of the features. Line, Point or Area MAP Layers containing attribute information can be labelled using this filter. All selected features on MAP Layers (which contain appropriate attribute information) can be labelled using this tool. Data selected on multiple MAP Layers can be labelled simultaneously. In addition, you may specify options such as alignment to lines of latitude, minimum font size, horizontal scaling and label position to place labels intelligently.

PREREQUISITES

Before using this filter you must create a **Text layer** in the **MAP Views** panel. Create a new Adobe Illustrator layer in the Adobe Illustrator Layers panel, and in the MAP Views panel, drag it to the MAP View holding the features you wish to label. Set the feature type to *Text* when prompted.

For best results, set up a character style for type font, size, justification and color. (Adobe Illustrator menu *Window > Type > Character Style*). Select the appropriate style in the Character Style panel before starting the Feature Text Label tool and MAPublisher will generate labels based on these settings. Otherwise labels applied will appear in the current default colour, font and font size. Then select the features that you want to label and go to *Filter > MAP Legend > Feature Text Label* or the MAPublisher toolbar button to access the function.

FEATURE TEXT LABEL SETTINGS

Source Layer and Column

You must first set the options for MAPublisher to determine the attributes that will be converted to text labels. The **Source Layer** list will show the Area, Point and/or Text layers currently containing selected data.

For each layer, the **Column** drop-down list(s) is populated with the attribute structure of that layer. You must choose a column that holds the attributes you wish to label the map with.

Target Text Layer

In the **Text layer** drop-down list(s), you must specify a Text layer that the labels will be output to. Note you can only output labels to text layers in the same MAP View as the Source Layer.

LABEL SETTINGS

MAPublisher provides options to specify label preferences such as label position, alignment to lines of latitude, minimum font sizes and horizontal scaling to best place labels within polygons and paths. These label settings are common to **Feature Text Label** and the **MAP Tagger Tool**.

Line Labels

MAPublisher will place Line labels intelligently, depending on the curvature and length of the line string. Click the **Line Labels** button to assign MAPublisher Line Label Settings.

** In Adobe Illustrator CS4, Feature Text Label is found in the Object > Filters > MAP Legend menu.*

MAPublisher controls where text is placed along lines by using the **Distance from start** option. Selecting **Auto** will place text at the midpoint for straight lines and for curved lines this will find the smoothest portion of the curved line closest to the midpoint. Selecting **Fixed**, the distance from start is set as a percentage of the length of the line.

Flip upside-down labels is enabled by default and will automatically orient labels correctly if your lines are flipped. Disabling this feature will not flip labels.

If the **Line Smoothing** option is used, MAPublisher creates a smoothed path for each text object in the selected Text layer and places the text along this path at the specified **Offset** value. The labels can then be dragged and positioned at any position along a line. If the *Line Smoothing* option is not selected, the labels follow the original path.

The **Label Position** option allows for the selection of the vertical position of the labels relative to the line. Three options are available: *Baseline*, *Descender,* and *Center*.

- Select **Baseline** to place labels above the generated text path.
- Select **Descender** to place the portion of a letter in a Latin-derived alphabet that normally extends below the baseline of a particular font above the generated text path.
- Select **Center** to place the centre the label on the generated text path.

Labels can be modified if they exceed the length of the line in the current default font size. First check the **Adjust label if larger than line** option to activate the label rules. Rules are executed by MAPublisher in a hierarchical order, and can be reordered by clicking the rule and clicking the **Up** or **Down** button.

Checking the **Reduce font size** option will allow you to reduce the size of the font to a specified minimum size in points. Checking **Reduce horizontal scaling** allows text to be scaled down horizontally by the percentage specified.

Feature Text Label also provides an additional option (not applicable in *MAP Tagger)*. If *any* of the labels have been adjusted in size due to the activation of a line adjustment rule, *all* labels can be resized to the same size by checking the **Set all labels to the same minimum font size** option.

If no rules are enabled, MAPublisher will not perform any label scaling. If none of the rules specified in the panel can be satisfied, MAPublisher will default to placing the label centered over the line. Also note that text generated for Line labels will be automatically orientated above the lines, irrespective of the direction of line digitization.

Area Label

MAPublisher will place Area labels intelligently, depending on the shape and size of the area polygon. Click the **Area Labels** button to assign MAPublisher Area Label Settings.

Decide how to place area labels—with a high degree of precision or lower degree of precision—by choosing the appropriate **Placement Accuracy** option.

If the **Labels curve with lines of latitude** option is selected, MAPublisher creates a path that conforms to local line of latitude and place the text along it. If this option is not selected, the labels are placed horizontally. This option is enabled only for MAP Views set with a projected coordinate system.

Labels can be modified if they exceed the size of the area in the current default font size. First select the **Adjust label if larger than area** option to activate the label rules. Rules are executed by MAPublisher in a hierarchical order, and can be reordered by clicking the rule and then the **Up** or **Down** button.

Checking the **Reduce font size** option will allow you to reduce the size of the font to a specified minimum size in points. Checking **Reduce horizontal scaling** will allow text to be scaled down horizontally by the fraction specified. Checking the **Wrap Labels that are longer than area** option will enter a carriage return at the nearest space in the text.

NOTE: The *Wrap Labels that are longer than area* option is not available if the *Labels curve with lines of latitude* option is checked.

Feature Text Label also provides an additional option which is not available with the *MAP Tagger tool*. If *any* of the labels have been adjusted in size due to the deployment of an area adjustment rule, *all* labels can be resized to the same size by checking the **Set all labels to the same minimum font size** option.

If no rules are enabled, MAPublisher will not perform any label scaling. If none of the rules specified in the panel can be satisfied, MAPublisher will default to placing the label centered over the area. In situations with area compounds, MAPublisher will label the largest area in the compound.

Point Labels

Click the **Point Labels** button to assign MAPublisher Point Label Settings.

If the **Labels curve with lines of latitude** option is selected, MAPublisher creates a path that conforms to local line of latitude and places the text along it. If this option is not selected, the labels are placed horizontally. This option is enabled only for MAP Views set with a projected coordinate system.

Adjust the **Label Position** by specifying where you want the label to be positioned relative to the point. The nine options in the list allow you to select where the text anchor will be placed.

FEATURE TEXT LABEL RESULTS

When all the *Layer Label Options* have been set and the *Label Settings* have been specified click **OK** to label the selected features.

Labels applied using Feature Text Label will appear in the current default colour, font and font size (as set by the selected character style).

IMPORTANT NOTE FOR CS2 USERS: Due to a known bug in the Adobe Illustrator CS2 text engine, running Feature Text Label on lines and/or generating text that curves with lines of latitude may result in a situation whereby undoing such an operation and subsequently running any other labelling operation causes an *apparent* hang or lockup of Adobe Illustrator CS2. Eventually, Adobe Illustrator will unlock or unfreeze and the operation will continue. This situation is only known to occur in Adobe Illustrator CS2 and typically happens when more than 500 labels are placed in a single instance. To avoid this problem when working with a large number of labels delete the unwanted labels rather than undoing the labelling operation. Adobe is aware of this issue. At the time of this writing every possible programmatic workaround has been explored by Avenza but due to the severity and nature of this Adobe bug, no solution is available yet. This is not an issue in Adobe Illustrator CS3 and CS4.

MAP Tagger Tool

Tools > MAP Tagger Tool

FUNCTIONALITY

The MAP Tagger Tool allows labels to be added to your map based on the attribute data of the features. Line, Point or Area MAP Layers containing attribute information can be labelled using this filter. This tool functions similarly to the *Feature Text Label* filter. However, labels are created by clicking the feature with the MAP Tagger Tool. You also have greater control over the initial placement of the label, because the label is placed where you click, and the tool provides the ability to create leader lines for labelling congested areas of the map. In addition, you may specify options such as alignment to lines of latitude, minimum font size, horizontal scaling and label position to place labels intelligently.

PREREQUISITES

Before using this filter you must create a **Text layer** in your MAP Views panel. Create a new layer in the Adobe Illustrator Layers panel, and in the MAP Views panel, drag it to the MAP View holding the features you wish to label. Set the feature type to *Text* when prompted.

For best results, set up a character style for type font, size, justification and color. (Adobe Illustrator menu *Window > Type > Character Style*). Select the appropriate style in the Character Style panel while using MAP Tagger tool, and MAPublisher will generate labels based on these settings. Otherwise labels applied will appear in the current default colour, font and font size.

The MAP Tagger Tool can be found towards the bottom of the Adobe Illustrator Toolbar. Double-click the tool to create new label settings or to edit settings.

MAP TAGGER TOOL SETTINGS

Source Layer and Column

You must first set the options for MAPublisher to determine the attributes that will be converted to text labels. The **Source Layer** list shows all Area, Point and/or Text layers in the current document.

For each layer, the **Column** drop-down list is populated with the attribute structure of that layer. You must choose a column that holds the attributes you wish to label the data with.

Target Text Layer

In the **Text layer** drop-down lists(s), you must specify a Text layer that the labels will be output to. Note you can only output labels to text layers in the same MAP View as the Source Layer.

LABEL SETTINGS

MAPublisher provides options to specify label preferences such as label position, alignment to lines of latitude, minimum font sizes and horizontal scaling to best place labels within polygons and paths. These Label Settings are common to **Feature Text Label** and **MAP Tagger Tool**. Please see page 102 for more details.

TAGGING MAP DATA

When you have set all your *Layer Label* options and specified *Label Settings*, click **OK** to close the dialog box and confirm your settings.

With the MAP Tagger Tool selected click the map object to label it.

The following list of keyboard modifiers may be used for additional labelling options:
(note = click map object with MAP Tagger Tool selected).

Labels placed using current Adobe Illustrator Type and MAPublisher settings.
L *Line labels are placed at click point and assigned angle of line at click point.*
A *Area labels are placed horizontally at click point.*
P *Point labels are placed horizontally at click point.*

+ Shift
Only applicable for Line labels. Labels placed using current Adobe Illustrator Type and MAPublisher settings.
L *Line labels are placed horizontally at click point.*

+ Shift + *drag*
Labels placed using current Adobe Illustrator Type and MAPublisher settings and leader line created on drag.
L *Line labels are placed horizontally. Leader line connects text to line feature.*
A *Area labels are placed horizontally. Leader line connects text to line feature.*
P *Point labels are placed horizontally. Leader line connects text to line feature.*

+ *drag*
Labels placed using current Adobe Illustrator Type and MAPublisher settings.
L *Line labels are assigned angle of line at click point.*
A *Area labels are placed horizontally.*
P *Point labels are placed horizontally.*

NOTE: To create custom leader lines use a graphic style. Create or load a graphic style and select it in the Graphic Styles panel while using the MAP Tagger Tool function.

Making Selections

MAPublisher contains tools for selecting data graphically and by attribute values.

The **MAP Selection Filters** tool provides functionality to create, edit and save multiple selection criteria. These selections can be applied on any MAP Layer, and are saved inside the document.

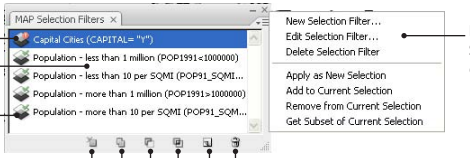
The **MAP Selection Stats** tool can be used for quickly selecting all features contained in a MAP Layer, for viewing how many objects are selected at a given time, to save a selection and to reverse selections.

The topics covered in this section are as follows:
MAP Selection Filters
MAP Selection Stats

MAP Selection Filters

Window > *MAPublisher* > *MAP Selection Filters* or *MAP Toolbar*

MAP Selection Filters panel



Not Valid Filter Icon - If the expression is not valid for that particular data layer a red exclamation mark will be displayed.

Filters List - Lists the Selection criteria in the current document.

Valid Filter Icon - When a selection filter contains an expression that is valid for the active Adobe Illustrator data layer a green check mark icon will be displayed.

Apply as New Selection - Makes a new selection using the highlighted criteria.

Add to Current Selection - Adds the highlighted criteria to the current selection.

Remove from Current Selection - Removes the highlighted criteria from the current selection.

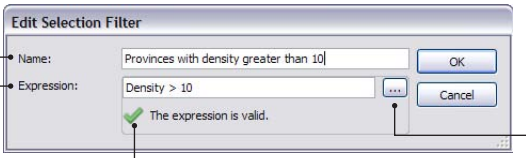
Edit Selection Filter - Opens the **Edit Selection Filter** function (below) for editing the assigned expression.

Delete Selection Filter - Deletes the highlighted filter(s).

Create New Selection Filter - Opens the **New Selection Filter** function (below) for the composition of an expression.

Get Subset of Current Selection - Makes a selection within the current selection.

New/Edit Selection Filter



Name - Assign or edit the name of the selection filter.

Expression - Enter the expression directly into the entry field, or click the Browse button to access the **Edit Expression** function (see chapter 5).

Edit Expression - Opens the **Expression Builder** for editing the assigned expression.

Expression Validity - Indicates if the expression is valid or invalid. If invalid, additional information is reported.

FUNCTIONALITY

MAPublisher Selection Filters allow you to build, edit and apply multiple selection criterias based on the attributes and properties contained in MAP Layers. Selection criterias are created in an expression builder. Selection filters can be applied to any MAP layer, and are saved in the document so that they can be edited or applied later.

CREATING A SELECTION FILTER

The MAP Selection Filters panel is opened by going to *Window* > *MAPublisher Panels* > *MAP Selection Filters* or clicking the MAPublisher toolbar button . This panel will contain a list of all the selection filters in the current document.

Create a new MAP Selection Filter by clicking the **Create New Selection Filter** button or panel options menu. This will open the **New Selection Filter** dialog box.

The **Name** text box can be edited to describe the selection filter or its intention. For example, a selection filter could be named *Cities* or *Countries with 80% or higher literacy.*

The **Expression** field describes the criteria for the selection of feature art. Build a valid expression in the Expression field. The **Expression Validity** icon will report if the expression entered is valid. Otherwise it will report and include additional warning notes.

Alternatively click the **Browse** button to enter and edit expressions via the **Edit Expression** tool (see chapter 5).

The following are some examples of basic expressions which can be entered for use as selection filters.

NAME = "Ontario"
Result: All items with the value "Ontario" in the NAME column are selected.

POPULATION < 1000000
Result: All items with values less than one million in the POPULATION column are selected.

NAME = "Ontario" OR NAME = "Alberta"
Result: Items with the value "Ontario" OR "Alberta" in the NAME column are selected.

NAME = "Ontario" AND POPULATION < 1000000
Result: Only items containing the value "Ontario" in the NAME column AND values less than one million in the POPULATION column are selected.

Click **OK** to create the filter, adding it to the list of filters in the panel.

EDITING AND DELETING SELECTION FILTERS

The name and entered expression can be edited. To edit a MAP Selection Filter, double-click the appropriate selection filter in the panel, or click the selection filter in the panel and click the **Edit Selection Filter** in the panel options menu. This will open the **Edit Selection Filter** dialog box. Delete a MAP Selection Filter by clicking the **Delete Selection Filter** button or menu item.

MAKING SELECTIONS

Once MAP Selection Filters have been created they can be applied to a MAP layer. Selection filters can only be applied to one layer at a time. However, more than one filter may be applied simultaneously (use **Shift** or **Ctrl** (Windows) or **Command** (Mac) to select multiple filters). When applying multiple selection filters, art only has to satisfy one of the chosen selection filters to qualify (i.e. multiple selection filters are combined using the "OR" operator).

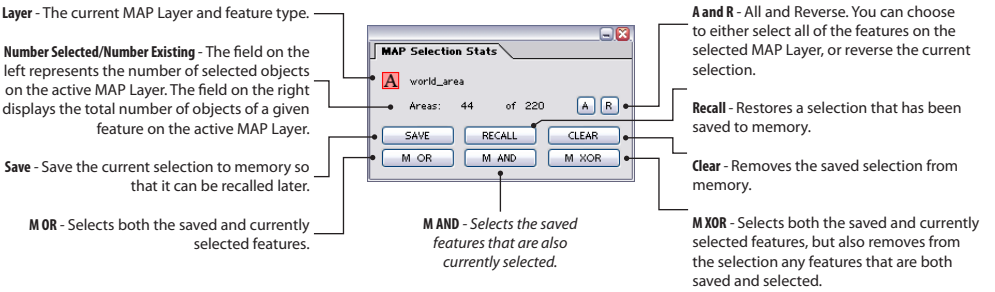
NOTE: When the expression is marked as valid, it is not necessarily valid when applied to a given layer. For example, the expression Country="Ohio" is only applicable to a layer with the Country attribute. If an expression is not valid for a layer, an error is shown when the selection filter is applied.

There are four methods of applying a selection filter (available as buttons and menu items):

- **Apply as New Selection:** Clears the current selection and selects any art on the current layer that meets the criteria of the chosen selection filter(s).
- **Add to Current Selection:** Adds any art on the current layer that satisfies the chosen selection filter(s) to the current selection.
- **Remove from Current Selection:** Deselects any art on the current layer that is selected and satisfies the chosen selection filter(s).
- **Get Subset of Current Selection:** Deselects any art on the current layer that is selected and does not satisfy the chosen selection filter(s).

MAP Selection Stats

Window > *MAPublisher* > *MAP Selection Stats* or *MAP Toolbar*


Layer - The current MAP Layer and feature type.
Number Selected/Number Existing - The field on the left represents the number of selected objects on the active MAP Layer. The field on the right displays the total number of objects of a given feature on the active MAP Layer.
Save - Save the current selection to memory so that it can be recalled later.
M OR - Selects both the saved and currently selected features.
MAP Selection Stats
world_area
Areas: 44 of 220
A
R
SAVE
RECALL
CLEAR
M_OR
M_AND
M_XOR
M AND - *Selects the saved features that are also currently selected.*
A and R - All and Reverse. You can choose to either select all of the features on the selected MAP Layer, or reverse the current selection.
Recall - Restores a selection that has been saved to memory.
Clear - Removes the saved selection from memory.
M XOR - Selects both the saved and currently selected features, but also removes from the selection any features that are both saved and selected.

USING THE MAP SELECTION STATS PANEL

Open the **MAP Selection Stats** panel by going to *Window* > *MAPublisher* > *MAP Selection Stats* or clicking the MAPublisher toolbar button .

Layer Statistics

On initial opening, this panel will display the **total** number of Map features that exist on the current MAP Layer, as well as how many are currently **selected**. As only one feature type is supported per MAP Layer, this dialog box will only display the current feature type. Only MAPublisher objects will be displayed in the MAP Selection Stats panel. Objects that are in [Non-MAP layers] in the MAP Views panel, will not be recognized in this panel.

Selecting objects manually or via a MAP Selection Filter will update the left hand field in this panel. The right hand field will display the total number of map features that exist on the current MAP Layer.

All or Reverse

The dialog box offers a quick way to select all map features on the current layer. Simply click the **A** (All) button to select all the Map features on the current layer.

Clicking the **R** (Reverse) button will reverse the current selection (i.e. all the features that were selected will be deselected, and the features that were deselected will be selected).

Saving Selections

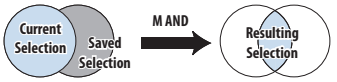
The **Save** button will save the current selection to memory, allowing you to retrieve your selection again later. Only one selection can be saved, and it is limited to the current Adobe Illustrator session. A subsequent click of the **Save** button will overwrite the original saved selection.

Clicking **Recall** will perform the selection that is saved to memory. Clicking **Clear,** will remove the saved selection from memory.

Additional Selection Options

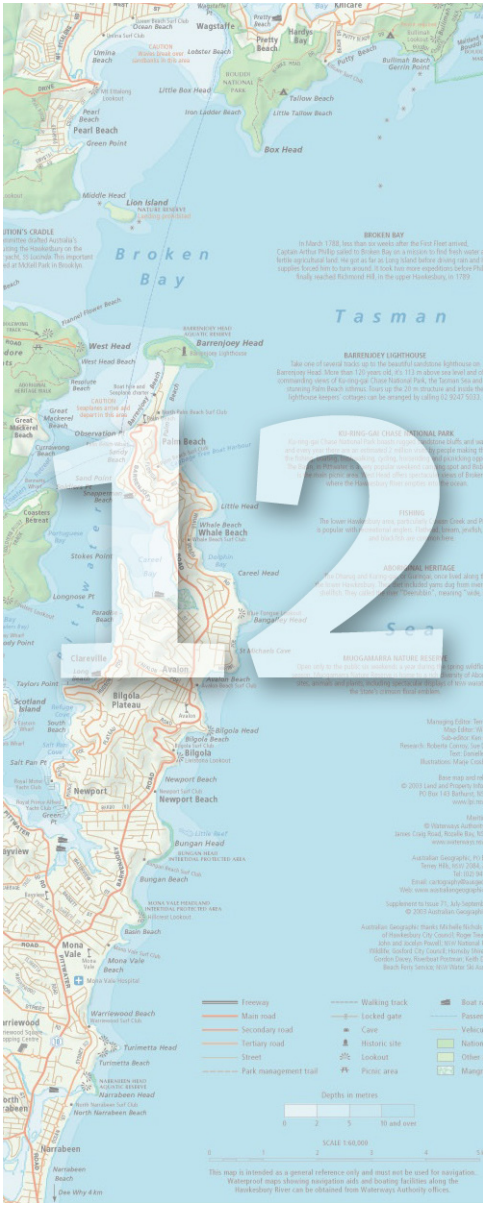
This panel also offers additional selection tools: **M OR**, **M AND**, and **M XOR**.

Clicking the **M OR** button will select both the currently selected objects and the saved selection.



The **M AND** button will select the map features in the current selection which are included in the saved selection.

The **M XOR** button will select both the currently selected features and the saved selection if these selections do not overlap. However if the current selection includes any features that are part of the saved selection, those will be deselected.



Working With Images

MAPublisher contains tools for working with georeferenced raster images such as aerial photography and satellite imagery.

The **Register Image** filter allows for accurately registering raster images, with georeferencing information, to your vector map data.

The **Export Image** filter provides the functionality to export raster images with various georeferenced formats.

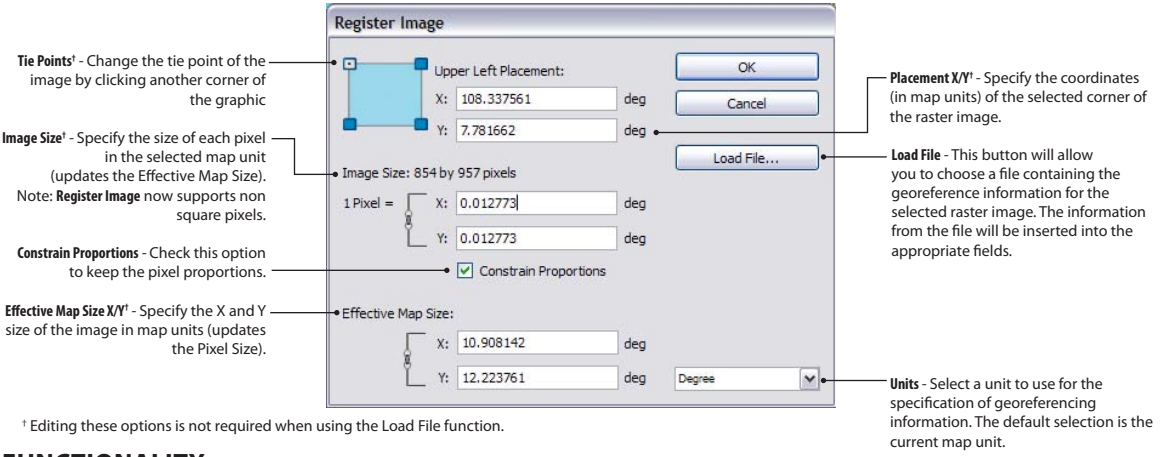
Georeferencing information for such images are usually stored in a separate text file (except GeoTIFF) where the image and its associated reference file have the same file name but a different file extension.

The reference file formats that can be read by Register Image, or written to by Export Image are:
World (*.tfw)
Image Report (*.irp)
MapInfo TAB (*.tab)
ListGeo (*.lgo)
GeoTIFF (*.tif) (a single file containing both the image and its reference data)

Topics covered in this section are:
Register Image
Export Image

Register Image

*Filter > MAP Images > Register Image** or *MAP Toolbar*


Register Image
Upper Left Placement:
X: 108.337561 deg
Y: 7.781662 deg
OK
Cancel
Load File...
Image Size: 854 by 957 pixels
1 Pixel =
X: 0.012773 deg
Y: 0.012773 deg
Constrain Proportions
Effective Map Size:
X: 10.908142 deg
Y: 12.223761 deg
Degree
Tie Points† - Change the tie point of the image by clicking another corner of the graphic
Image Size† - Specify the size of each pixel in the selected map unit (updates the Effective Map Size). Note: Register Image now supports non square pixels.
Constrain Proportions - Check this option to keep the pixel proportions.
Effective Map Size X/Y† - Specify the X and Y size of the image in map units (updates the Pixel Size).
Placement X/Y† - Specify the coordinates (in map units) of the selected corner of the raster image.
Load File - This button will allow you to choose a file containing the georeference information for the selected raster image. The information from the file will be inserted into the appropriate fields.
Units - Select a unit to use for the specification of georeferencing information. The default selection is the current map unit.

† Editing these options is not required when using the Load File function.

FUNCTIONALITY

The **Register Image** filter is used to accurately register raster imagery to your vector data. MAPublisher determines the parameters of the raster image and the coordinate system of a selected **MAP Layer** in the registration process.

PREREQUISITES

For Register Image to be functional, the raster image must be in the same coordinate system as the MAP Layer you wish to register it to. Check the coordinate system of your imagery with your data provider before attempting to use this filter.

It is possible to transform the coordinate system in MAPublisher first (see the **MAP View Editor** in chapter 4) if you require your vector data to match your imagery. Alternatively you can use Avenza's **Geographic Imager** for Adobe Photoshop to transform the imagery to match the coordinate system of the MAP View.

When you are certain that both your MAP Layer and your raster image are in matching coordinate systems, you can place the image into Adobe Illustrator. To do so, follow the steps below:

- In Adobe Illustrator Layers panel, create a new layer.
- In the **MAP Views** panel switch this new layer from the *[Non-MAP Layers]* section to the intended **MAP View** (by *click and drag* or using *Switch MAP Views*)—the layer becomes a MAP Layer. As this new MAP layer will be holding the Image only, you can assign it any feature type.
- Finally, use the Adobe Illustrator **Place** function (*File > Place*) to select the image and place it onto your new MAP layer.

NOTE: The image can be placed on any existing MAP layer, but its recommend using a specific layer, dedicated only to the image registration for better layer management and workflow.

At this point, the image is placed on the artboard in a default location and with a default size. It still needs to be registered. With the image selected go to *Filter > MAP Images > Register Image* or click the MAPublisher toolbar button to access the function.

** In Adobe Illustrator CS4, Register Image is found in the Object > Filters > MAP Images menu.*

USING REGISTER IMAGE

Registration via Reference File

To select a reference file click the **Load File** button and navigate to the folder containing your reference file. The reference file will normally be of the same name as your image, but will have the extension *.irp, .tfw, .tab, .lgo* or. *tif.* If your image is a GeoTIFF, you should select your image file in order to retrieve georeferencing information, as files of this type will contain both the image and its reference data. Select your reference file and click **Open**. The values contained in this reference file will be entered automatically into the image parameters.

Manual Registration

To manually enter image parameters you must have one of the following available in page units *or* map units:
a) The X and Y coordinates of one corner of the image *and* the X and Y Pixel Size.
b) The X and Y coordinates of one corner of the image *and* the X and Y size of the image.

First choose the units you wish to use for entering parameters by making a selection from the **Units** drop-down list.

Set the **Corner Coordinates** you have known values for, by clicking the appropriate corner of the graphic. Then enter the X and Y coordinates for this location in the adjacent fields.

Next set *either* the **Pixel Size** or **Effective Map Size**. The *Pixel Size* is the value of a single pixel in the units set. The *Effective Map Size* is the X and Y size of the whole image in the units set. Setting either option will update the other accordingly.

NOTE: The MAPublisher Register Image now supports the registration of images having non-square pixels.

RESULTS

When you are confident that all values have been assigned correctly, click **OK**.

Providing the coordinate systems of the raster image and the MAP Layer match, and the values you have either entered manually or via a reference file are correct, the image will be scaled and registered with your vector data.

NOTES:

- Raster images cannot be transformed into another coordinate system. So after your image is registered and the vector data is transformed through the **MAP View Editor** *Perform Coordinate System Transformation* function, the image will have to be transformed externally (with Avenza's **Geographic Imager** for example) and registered again in MAPublisher.
- Registered images can be re-scaled and rotated together with the vector data. The registration process must be redone after the vector data has been re-scaled or rotated using the **MAP View Editor**. In the case of a manual registration, it is recommended to export the image before applying the changes to the vector data (next page). This way, registering the image again is only a matter of loading a reference file.

SUPPORTED GEOREFERENCED IMAGE REFERENCE FORMATS

World File (*.tfw, *.tifw, *.wld, *.eww, *.jgw, *.jpw, *.pgw, *.sdw, *.eww, *.blw, *.dmw)

World files contain the affine relationship between source image coordinates (pixel locations) and real-world reference coordinates (lat/long or other real-world coordinate units). World files simply contain a computed relationship between source image coordinates and reference coordinates and not the complete reference point information. World files do not support storing coordinate system information.

IRP Image Report File (*.irp)

IRP Image Report files are ASCII report files indicating the coordinates of the four corners of the raster file and the pixel size in ground units to allow for georeferencing of the image in other image processing, CAD, or GIS programs.

MapInfo TAB File (*.tab)

MapInfo Table file formats save the complete reference point list information such that it can be loaded again in the future. MapInfo TAB files support storing coordinate system information.

Supported projections when saving the coordinate system are listed below:

Albers Equal-Area	Hotine Oblique Mercator	Hotine Oblique Mercator 1pt
Azimuthal Equidistant	Lambert Azimuthal Equal Area*	Polyconic
Cylindrical Equal Area*	Lambert Conic Conformal	Robinson*
Eckert IV*	Mercator*	Sinusoidal*
Eckert VI*	Miller Cylindrical*	Swiss Oblique Mercator
Equidistant Conic*	Mollweide*	Stereographic Transverse Mercator
Gall Stereographic*	New Zealand Map Grid	

* Coordinate Systems using this projection will not be stored when saving the reference file.

ListGeo file (*.lgo)

A ListGeo files are text files containing the GeoTIFF metadata information (or tags), which can then be read, and may also be used as input to other programs.

GeoTIFF File (*.tif, *.tiff)

Tagged Image File Format (TIFF or TIF) is a common raster graphic file format and one of the most common geospatial image formats you are likely to come across. Many raster geographic images from GIS systems are stored in this format. A GeoTIFF is a TIFF file with embedded geographic information such as position and scale in world coordinates, affine transformation or an explicit list of ground control points.

NOTE: The only way to differentiate a regular TIFF image from a referenced GeoTIFF image is to open it in a spatial imaging software application (such as Avenza's **Geographic Imager** product).

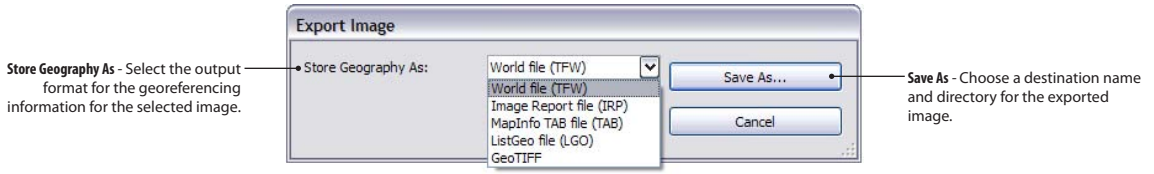
Unlike the other geographically referenced image formats discussed in this section, GeoTIFFs do not require a separate reference file. When registering a GeoTIFF image in MAPublisher, the same file name must be selected in the **Load File** dialog box—the required georeference information is contained in the file header.

Supported projections when saving the coordinate system are listed below:

Albers Equal-Area
Cassini-Soldner - Cassini
Cylindrical Equal Area
Equidistant Conic
Equidistant Cylindrical
Equirectangular
Gnomonic
Hotine Oblique Mercator
Laborde Oblique Mercator
Lambert Azimuthal Equal Area
Lambert Conic Conformal (1SP)
Lambert Conic Conformal (2SP)
Lambert Cylindrical Equal Area
Mercator
Miller Cylindrical
New Zealand Map Grid
Oblique Mercator
Oblique Stereographic
Orthographic
Polar Stereographic
Polyconic
Robinson
Sinusoidal
Stereographic
Transverse Mercator
Transverse Mercator (South Oriented)
VanDerGrinten

Export Image

Filter > *MAP Images* > *Export Image* or *MAP Toolbar*


Export Image
Store Geography As - Select the output format for the georeferencing information for the selected image.
Store Geography As:
World file (TFW)
World file (TFW)
Image Report file (IRP)
MapInfo TAB file (TAB)
ListGeo file (LGO)
GeoTIFF
Save As...
Cancel
Save As - Choose a destination name and directory for the exported image.

FUNCTIONALITY

MAPublisher offers the ability to export placed raster files as georeferenced images for use in other programs and/or for archival purposes. This can be useful in a number of ways. For example, when working with an image for which there is no georeferencing file you can use the MAPublisher **Export Image** function to create a GeoTIFF or other georeferenced image file based upon the coordinate system of the host MAP View.

The **Register Image** filter can be used to accurately position and scale imagery with vector data. Alternatively you can manually move, scale or rotate imagery to align with artwork in a designated MAP View. If your host MAP View contains accurate georeferencing information you can use Export Image to save raster data to a fully georeferenced image format. It is also possible to convert your vector artwork to a georeferenced raster image.

MAPublisher will export the selected image as a TIF, with a choice of the five reference file formats (see the following pages).

USING EXPORT IMAGE

With the image selected, go to *Filter* > *MAP Images* > *Export Image* or click MAPublisher Toolbar button .

The **Store Geography as** drop-down list will show the five available reference file formats. A regular **TIF** file will be generated with a reference file carrying the extension **TFW**, **IRP**, **TAB** or **LGO** if you choose one of these formats. If you select **GeoTIFF** from this drop-down list, only a **TIF** file will be produced, as this will carry both the image and the georeferencing information.

RESULTS

When you have set all of your export options, click the **Save As** button. This will allow you specify a name for the TIF file, and the location where it will be saved. If the format is a TIF and reference file combination, the reference file will carry the same file name and will be saved to the same location as the TIF.

You can subsequently use this image file in imagery applications, such as Avenza's **Geographic Imager** for Adobe Photoshop**,** or in other Adobe Illustrator documents using MAPublisher.

NOTE: Exporting linked images in CMYK color mode will create an incorrect result. These images must either be set to a different mode or embedded prior to exporting.

** In Adobe Illustrator CS4, Export Image is found in the Object > Filters > MAP Images menu.*

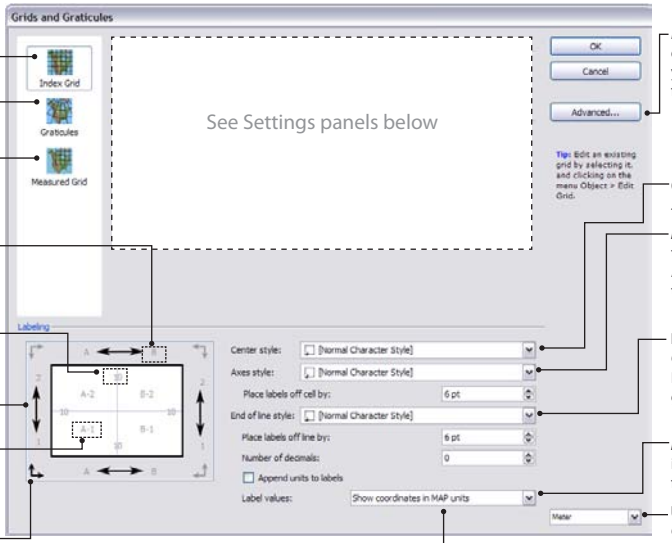
Grids and Indexes

MAPublisher contains tools to easily create map grids and map indexes. Grids can be created for reference purposes, or to follow designated lines such as latitude and longitude, and can also be labelled for indexing. When a labelled grid has been established, MAPublisher is able to generate index files, containing the location of text objects in MAP Layers.

Topics covered in this section:
Grid and Graticules
Make Index

Grids and Graticules

*Filter > MAP Legend > Grids and Graticules** or *MAP Toolbar*
Object > Edit Grid / Edit Graticules



Grid/Graticule Selection - Click the appropriate button to select the grid type required and to assign settings (see below). Note: Measured Grids can only be created on MAP Views in projected coordinate systems.

Axis Labels - Solid graphic denote an enabled labelling option. Click an axis label to toggle all labels on that axis ON or OFF.

Line Labels - Solid graphic shows labels will be generated. Click the line label to toggle it ON or OFF.

Label Direction - Click to reverse the direction that labels increment.

Cell Labels - Solid graphic shows labels will be generated. Click a cell label to toggle all center labels ON or OFF.

Flip Label Axes - Click to flip which axis will be labelled alpha and which numerically.

Advanced - To access the **Advanced** dialog box (page 125), enabling you to specify additional options for your grid or graticules.

Center Style† - Select the *Character Style* to use for the Center Labels.

Axes Style† **/ Place off grid cell** - Select the *Character Style* to use for the Axis Labels. Select a distance off the grid to place the labels.

Line Style† **/ Place off line** - Select the *Character Style* to use for the Line Labels. Select a distance off the grid to place the labels.

Append units to labels - Choose to include labels (i.e. degree symbols) for Line Labels.

Units - Set the units for *Measured Grid* dimensions if appropriate.

Labels Values - Select the type of labels to display (distances measured from the lower left corner of the grid, or actual projected coordinates (Eastings/ Northings)

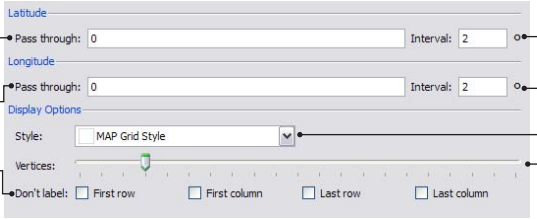
† *If the* **Center, Axes** *and* **Line style** *lists do not contain a recently created character style, simply return to the Character Style panel, double-click this style and click OK in the Character Style Options dialog box. This forces Adobe Illustrator to re-load the list of character styles.*

Index Grid Settings

Number of Columns and Rows - Specify the number of columns and rows which will comprise the grid.

Style - Select a style for the grid lines.

Graticule Settings



Pass through latitude - Specify a line of latitude that must be included (this can be any meridian within the data extents).

Pass through longitude - Specify a line of longitude that must be included (this can be any meridian within the data extents).

Don't label - Checking any of these boxes will not label a specific column or row.

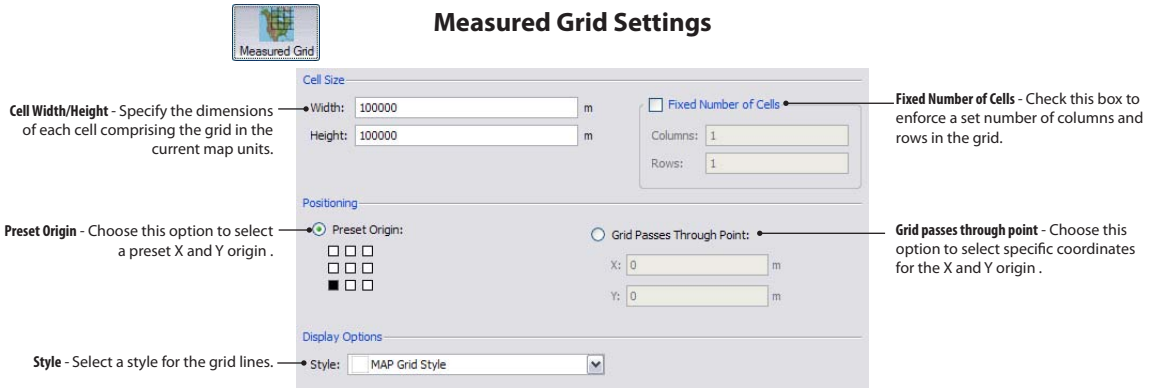
Latitude Intervals - Specify the interval for each line of latitude.

Longitude Intervals - Specify the interval for each line of longitude.

Style - Select a style for the graticules.

Vertices - Use the slider to increase or decrease the number of nodes which will be used in the construction of the graticules (use a higher number if graticules will be curved).

** In Adobe Illustrator CS4, Grids and Graticules is found in the Object > Filters > MAP Legend menu.*


Measured Grid
Measured Grid Settings
Cell Size
Width: 100000 m
Height: 100000 m
Fixed Number of Cells
Columns: 1
Rows: 1
Positioning
Preset Origin:
Grid Passes Through Point:
X: 0 m
Y: 0 m
Display Options
Style: MAP Grid Style
Cell Width/Height - Specify the dimensions of each cell comprising the grid in the current map units.
Fixed Number of Cells - Check this box to enforce a set number of columns and rows in the grid.
Preset Origin - Choose this option to select a preset X and Y origin .
Grid passes through point - Choose this option to select specific coordinates for the X and Y origin .
Style - Select a style for the grid lines.

FUNCTIONALITY

The Grids and Graticules tool will generate fully editable grid lines based on a number of user-defined settings.

There are three grid types available. Selecting **Graticules** allows you to plot grid lines at specific lines of latitude and longitude which will be automatically curved if applicable. Choosing an **Index Grid** allows you to specify the number of cells that you wish to divide the current grid extents into. Choosing a **Measured Grid** also allows you to place grid lines, but with advanced control over placement, size, alignment, and labels using projected coordinates.

A number of labelling options exist for each type of grid, allowing grid lines and grid cells to be labelled if required.

Any form of grid plotted with this tool can be subsequently resized using the bounding box of the grid, and any parameter can be specifically edited via the *Object > Edit Grid / Edit Graticules* menu item.

PREREQUISITES

Before using this filter you must create a **Legend layer** in your Adobe Illustrator layers panel. Create a new layer, and then drag this to the MAP View holding the features on which you wish to plot a grid, remembering to set the feature type to Legend.

MAPublisher will use the *Normal Character Style* when generating grid labels. If you wish to use a different text size, justification, font, stroke colour and weight, it is useful to create a new character style at this stage *(Window > Type > Character Styles)*. A default grid line style will also be used. If you wish to use an alternate style for the grid lines, add the desired style to the *Graphic Styles* panel prior to accessing the Grids and Graticules function.

The MAP View must have a coordinate system assigned in order to plot a grid. Graticules and Index Grids can be generated for any coordinate system. Measured Grids cannot be generated for a geodetic coordinate system used in a MAP Views.

To access the function select the legend layer and navigate to *Filter > MAP Legend > Grids and Graticules* or MAPublisher toolbar button .

INDEX GRIDS

The *Index Grid* option allows grids to be created by dividing the extents of the current MAP View into a specified number of cells. Specify the **number of columns and rows** which will comprise the grid, and select a graphic style for the grid lines.

GRATICULES

The *Graticules* option permits grid lines to be placed at specific degree positions and intervals. Specify **a line of latitude and/or longitude that graticule lines must pass through**. Then specify the **interval** for each subsequent line of latitude and longitude, and select a **graphic style** for the grid lines. Use the **slider** to increase or decrease the number of vertices used in the graticules if required (use a higher number if the graticules will be highly curved due to the current projection). The graticule may have a section in one of the corners that you do not wish to label (perhaps there is no data in this graticule, or there is only a small portion of that graticule showing and it does not need to be labelled). The **don't label** feature allows you to not label a specific column or row.

MEASURED GRIDS

The *Measured Grid* option allows for cells to be plotted at **specific sizes** and **position** when there is a projected coordinate system in the current MAP View. The extents of the grid can be modified using this option within the geographical extents of the current MAP View. The width and height of each cell composing the grid should be specified in the **Width** and **Height** text boxes (you can modify the map units used for these dimensions if required by making an alternate selection in the *Units* list). A **fixed number of cells** for columns and rows can be enforced if required. Additionally you can specify a **preset** X and Y **origin** for the grid, or choose specific coordinates for a **pass-through point**.

LABELLING OPTIONS

A number of labelling options are available for use in grids and graticules. **Axis labels** and **cell labels** for indexing can be included, the **direction of axis** and cell labels can be modified and the axes used for alpha and numeric labels can be flipped. The ability to choose between **labels starting from zero** and **actual projected coordinates** is also when labelling the **end of line**.

When using graticules on projected world maps, axis and line labels may not display properly (due to the extreme curvature of the graticules at the edges). In this case, it is recommended to use the **don't label options**.

The labelling graphic shows the status of axis, cell and line labels (*solid labels mean that label is enabled, grey labels mean that label is OFF*). Click any cell label to switch all cell labels on or off. Click a line label to switch that line label only on or off. Click an axis label to switch the labels on that axis only on or off. Click a horizontal arrow to flip the direction of labels on the top and bottom axes. Click a vertical arrow to flip the direction of labels on the left and right axes. Click a corner graphic to swap which axes are labelled numerically and which are labelled alphabetically.

For indexing choose a character style to use for the cell labels by selecting an entry for **Center Style**, choose a character style to use for the labels on each axis by selecting an entry for **Axes Style**. For axes labels specify a distance away from the edge of the grid that the labels will be placed. Choose a character style to use for the line labels

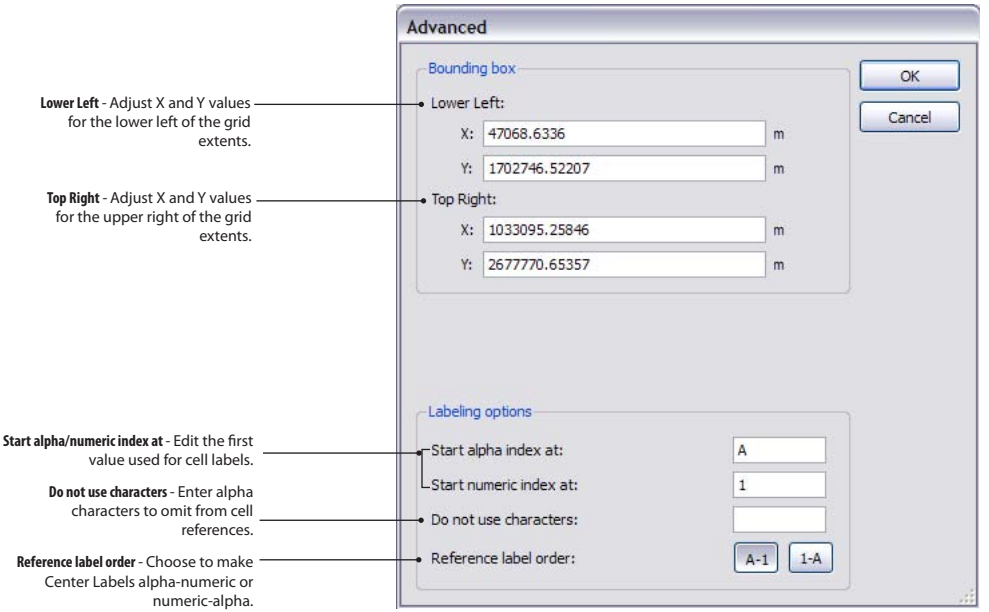
by selecting an entry for **End of Line Style** to label the position of the grid or graticule in map units. Select actual coordinates or distance from zero with the lower left corner being the origin. For end of line labels specify a distance away from the edge of the grid that the labels will be placed, and append the current units to each label.

ADVANCED OPTIONS

Click the Advanced button to access additional grid extents and labelling options.

Modify the extents of the grid by entering new coordinates for the *Lower Left* and *Top Right* position of the grid in the current units.

It is also possible to edit the first value used for cell labels by editing the *Start alpha/numeric index at* values. Omit certain alpha characters from cell references with the *Do not use characters* option. For example, it may be useful to omit the characters "I" and "O" for indexing purposes (when entering alpha characters to omit, separate characters with a comma). The Reference label order option can be edited to change the center labels from alpha-numeric (A-1) to numeric-alpha (1-A), or vice versa.


Lower Left - Adjust X and Y values for the lower left of the grid extents.
Top Right - Adjust X and Y values for the upper right of the grid extents.
Start alpha/numeric index at - Edit the first value used for cell labels.
Do not use characters - Enter alpha characters to omit from cell references.
Reference label order - Choose to make Center Labels alpha-numeric or numeric-alpha.
Advanced
Bounding box
OK
Cancel
Lower Left:
X: 47068.6336 m
Y: 1702746.52207 m
Top Right:
X: 1033095.25846 m
Y: 2677770.65357 m
Labeling options
Start alpha index at: A
Start numeric index at: 1
Do not use characters:
Reference label order: A-1 1-A

GENERATING AND EDITING THE GRID

When all the options have been set, click **OK** to create the grid. The grid will be plotted on the legend layer using the entered parameters.

Use the bounding box of the generated grid *(View > Show Bounding Box)* to resize if required. Resizing grids horizontally or vertically will add or remove component cells in the grid.

After transforming a MAP View containing a grid, the grid will be transformed and rescaled within its current bounds (the physical extents of the grid on the page is not edited). In this scenario you should use the bounding box to resize the grid to the new bounds.

If you wish to change any parameter without generating a new grid, simply select the grid and access the *Object > Edit Grid/Edit Graticules* menu item. This will re-open the Grids and Graticules function and the current parameters of the grid will be available for editing. You can even choose an alternate grid type if required.

IMPORTANT NOTES

Manually editing type position, font, colour etc is not possible on Grids and Graticules in their default grouped state. Manual editing is possible however if you first expand the object *(Object > Expand),* though this will negate any opportunity to subsequently edit the art via the Grids and Graticules filter.

Certain projected coordinate systems may cause incomplete grids and/or graticules to be drawn. Such issues may occur if the MAP View is in a polar coordinate system or the extents of the data cross the 180 degree west/east meridian.

Measure grids cannot be labelled properly using actual coordinates when the data is projected using a stereographic or orthographic coordinate system.

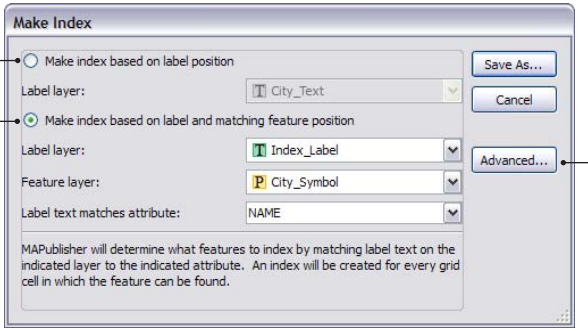
If the generation of a grid/graticule causes blank or incomplete results, the following workflow should be used:

1. Transform the MAP View to a geodetic coordinate system (e.g. WGS 84).
2. Generate your grid or graticules on this MAP View.
3. Expand the object *(Object > Expand).*
4. Create a new area layer in the MAP View. Drag the expanded grid to this new layer.
5. Transform the MAP View back to the original projection.

Please see Appendix A3 for more information on working with grids and graticules in MAPublisher 8.

Make Index

Filter > MAP Legend > Make Index or MAP Toolbar* A-1

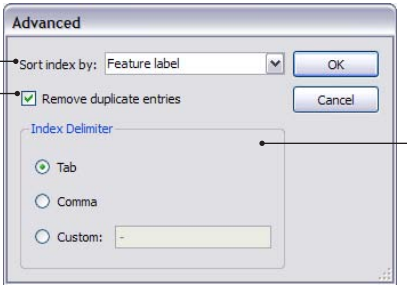

Make Index
Make index based on label position
Label layer:
City_Text
Make index based on label and matching feature position
Label layer:
Index_Label
Feature layer:
City_Symbol
Label text matches attribute:
NAME
MAPublisher will determine what features to index by matching label text on the indicated layer to the indicated attribute. An index will be created for every grid cell in which the feature can be found.
Save As...
Cancel
Advanced...

Make index based on label position - An index will be created by assigning one index location for each label found on the selected label text layer.

Make index based on label and matching feature position - MAPublisher will determine what features to index by matching label text on the selected *Label layer* to the indicated attribute on the *Feature layer*. An index will be created for every grid cell in which the labelled feature can be found.

Advanced - Click this button to open the **Advanced** dialog box (below), enabling you to specify additional options for your index.

Advanced Options



Sort index by - You can choose to sort the entries in the index file by either feature label or grid cell address.

Remove duplicate entries - If this box is checked, any duplicate index entries will be removed from the generated file.

Index Delimiter - Select a delimiter for the index file - Tab, Comma or Custom. If you choose Custom, enter the desired delimiter into the adjacent entry field.

FUNCTIONALITY

When a Grid or set of Graticules have been created, the Make Index filter can be used to generate an index for your map based on the position of text elements in referenced grid cells. Index files generated using this function are produced as a simple text file, and sorted alphabetically. A typical file would be formatted as follows:

Melrose Place	B-4
Richview Avenue	A-5
Sesame Street	A-4
Wisteria Lane	B-5

PREREQUISITES

In order to facilitate the creation of a map index using this filter you must have created an *Index Grid, Measured Grid* or set of *Graticules* using the **Grids and Graticules** filter. This grid must exist on a **Legend layer**, and be selected in order to access the function. An index will be created even if grid labels are hidden.

The **Text layer** containing the labels to be indexed must be located in the same MAP View as the grid.

Ensure the grid is selected, then go to *Filter > MAP Legend > Make Index* or MAPublisher toolbar button A-1 to access the Make Index tool.

** In Adobe Illustrator CS4, Make Index is found in the Object > Filters > MAP Legend menu.*

USING MAKE INDEX

Index Based on Label Position

This method will create an index by assigning one index location for each label found on the selected label text layer. For example if the label "High Street" is only found in grid cell A-4, the only entry for "High Street" in the index file would be as follows:

High Street A-4

Select the **Make index based on label position** button to generate an index using this method.
Then choose the **Label layer** from the drop-down list which contains the text you wish to index.

Index Based on Label and Matching Feature Position

This method will create an index by matching label text on a selected *Label Layer* to the indicated attribute on the *Feature layer*, creating an index entry for every grid cell in which the feature can be found. Note that only features that have labels can be indexed. For example if "High Street" passes through grid cells A-3, B-3 and C-4, the grid cells will be sorted alphabetically on one line.

High Street A-3, B-3, C-4

- Select the **Make index based on label and matching feature position** button to generate an index using this method.
- Choose the **Label layer** from the drop-down list which contains the text you wish to index.
- Choose the layer that was used to generate the labels from the **Feature layer** drop-down list.
- In the **Label text matches attribute** list, select the attribute column in the selected *Feature layer* which matches the labels you are indexing.

Formatting Options

If you wish to set additional options to control the formatting of your index file, click the **Advanced** button.

Choose an option to **Sort index by**. This will be the ordering of your index entries. The default is the **Feature label** itself, meaning for example, countries starting with *A* will be listed first. Alternatively, you can choose to index by **Grid cell**, meaning labels inside the cell marked *A-1* will be listed first.

If you require to remove entries that are duplicates (i.e. street names named twice in the same grid cell) you should click the option to **Remove duplicate entries**.

Make Index also provides an option to specify an **Entry Delimiter**, being the form of the separator between grid cell and text label for each index entry. You can choose from **Tab**, **Comma**, or specify a **Custom** delimiter.

Saving the Index File

When you have set all of your index options, click the **Save As** button. This will allow you specify a name for the text file, and the location where it will be saved. You can open this file in a text editor, or place it back into document using the Adobe Illustrator **Place** function*.

** Using Adobe Illustrator CS4 on Mac OS X, it is recommended to copy the index contents into a text box instead of using the Place function*.

Scale Bars and North Arrows

MAPublisher contains tools for plotting accurate scale bars and north arrows onto your map.

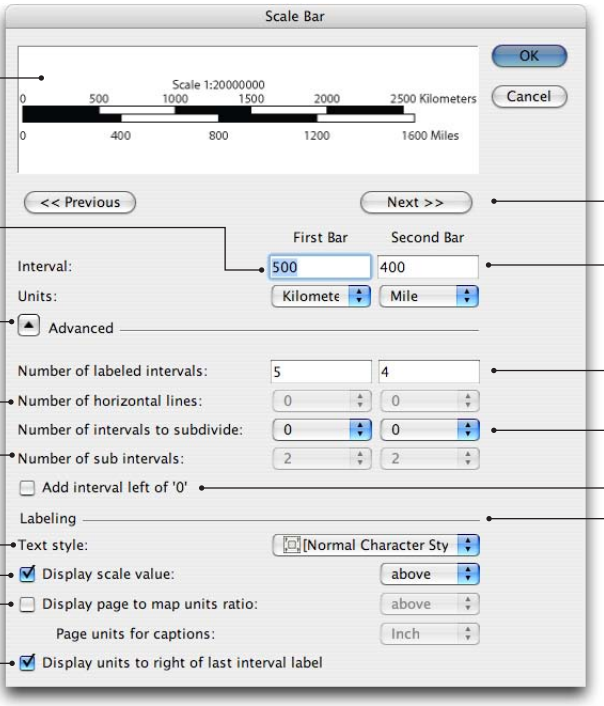
The **Scale Bar** filter offers a number of different designs that you can choose from, including double-bar designs for the placement of scale bars in multiple units.

North Arrows are created from selected artwork on the page using the **Create North Arrow** filter, and will be immediately aligned to true north.

Topics covered in this section are:
Scale Bar
Create North Arrow

Scale Bar

Filter > MAP Legend > Scale Bar or MAP Toolbar*
Object > Edit Scale Bar



Preview Panel - Displays a preview of the generated scale bar.

Units - Select the desired map units to be used in the selected scale bar.

Advanced toggle - Click to show or hide the scale bar options in the lower section.

Horizontal lines - Select the desired number of horizontal lines to be included in the scale bar. Used with certain scale bar styles only.

Sub intervals - Select the number of sub-intervals for each subdivided scale bar interval.

Text Style† - Select the Adobe Illustrator Character Style to be applied to the text.

Display scale value - Check this option to display the scale value above or below the bar.

Display page to map units ratio - Check this option to show the scale as page unit to map unit ratio. Page units is selectable from cm, mm or inch .

Display units - Check this option to display the interval unit on the scale bar.

Select Style - Use the Previous and Next buttons along with the Scale Bar Preview Panel to select the desired scale bar.

Interval - Specify the length of each interval in the selected map unit.

Labeled intervals - Enter the number of interval which will comprise each bar.

Intervals to subdivide - Enter the number of scale bar intervals to be subdivided.

Add interval left of zero - Check this box to have an interval placed on the scale bar to the left of the zero mark.

Labelling - Set a style for labels from the Character Styles panel. Display the scale value and specify its location. Display a page to map units ratio and choose its location. Display the units used in each bar if required.

† *If the* **Text style** *list does not contain a recently created character style, simply return to the Character Style panel, double-click this style and click OK in the Character Style Options dialog box. This forces Adobe Illustrator to re-load the list of character styles.*

FUNCTIONALITY

MAPublisher contains ten different scale bar designs that you may incorporate into your map. After creation, MAPublisher scale bars can be subsequently resized via a bounding box (for example to add or remove component intervals). Scale bars can also be edited by selecting the *Object > Edit Scale Bar* menu item.

PREREQUISITES

To accurately create a scale bar your MAP View must contain accurate georeferencing information and the coordinate system must be projected. (i.e. not in degrees) . The MAP Layer on which you intend to create your scale bar must be a selected (active) and unlocked **Legend layer**. If you require a custom character style to be used for the labels of the Scale Bar, it is also advisable to establish this style *(Window > Type > Character Styles)* before opening this dialog box.

The **Scale Bar** dialog box is accessed by clicking the menu *Filter > MAP Legend > Scale Bar* or MAPublisher toolbar button .

** In Adobe Illustrator CS4, Scale Bar is found in the Object > Filters > MAP Legend menu.*

ADDING A SCALE BAR

Standard Options

Use the **Previous** and **Next** buttons to select the scale bar design you require. Note that certain scale bar designs contain two bars and when such a design is selected, the *Second Bar* column of options will be enabled.

In the **Units** drop-down list, specify the units that you wish the scale bar interval(s) to be based on. The default units are that of the current MAP View.

In the **Interval** text box(s), specify a real-world distance that each interval of the scale bar will represent. This figure will be in the unit you specified in the **Units** list.

NOTE: A scale bar cannot be created on a MAP View that contains a coordinate system using custom (user defined) point styles or units.

Advanced Options

Click the Advanced button to show or hide additional scale bar parameters. Specify the number of cells in the bar(s) by entering a figure in the **Number of labeled intervals** entry field.

Depending on the style of scale bar you have chosen, you can also specify the **Number of horizontal lines** that will compose the scale bar.

If you wish some of the intervals or cells in the bar(s) to be additionally subdivided, choose a figure from the **Number of intervals to subdivide** list. The subdivided cells will begin from the left of the bar(s). The **Number of sub-intervals** that compose each of these cells can be specified in the next list. You can also choose to **Add an interval left of zero** if required.

Labelling Options

Choose a **Character style** for the scale bar labels by choosing a style from the list. The label options allow you to add extra scaling information to the generated scale bar. The text that will be generated by this tool is displayed in the Preview panel when the options are set.

Generating the Scale Bar

When you click **OK** the selected scale bar will be placed on the legend layer at a default position. The Adobe Illustrator editing tools may be used to move the scale bar to a desirable location.

EDITING A SCALE BAR

Use the bounding box of the generated scale bar (*View* > *Show Bounding Box*) to resize. Resizing scale bars horizontally will add or remove intervals from the bar(s). Resizing vertically will adjust the width of the bar(s).

Scale bars can also be resized using the Adobe Illustrator menu *Object* > *Transform* >*Transform Each*, by changing the horizontal or vertical scales.

If you require a different design to be used for your scale bar, or wish to change any parameter without generating a new version, select the scale bar and access the *Object* > *Edit Scale Bar* menu item. This will re-open the Scale Bar dialog box and the current parameters of the bar will be available for editing.

NOTE: Manually editing the type position, font, colour etc. is not possible on scale bars in their default grouped state. However, manual editing is still possible if the object is expanded first (*Object* > *Expand*). Please note, however, that his will remove all opportunity to subsequently edit the art via the Scale Bar filter. Please see Appendix 3 page A3/3 for more information on working with scale bars in MAPublisher 8.

Create North Arrow

*Filter > MAP Legend > Create North Arrow** or *MAP Toolbar*

FUNCTIONALITY

The MAPublisher **Create North Arrow** filter provides the functionality to convert selected symbology into a geographically correct north arrow. Once the north arrow is created it will be rotated to true north, and this property will be maintained through subsequent reprojection or rotation.

PREREQUISITES

The MAP Layer on which the art to be converted to a north arrow resides must be a **Legend** layer, and be selected. This Legend layer must be hosted by the **MAP View** that you wish to base the alignment of the north arrow on.

CREATING A NORTH ARROW

Select the piece of art that you want to convert to a north arrow. The art can be any form of artwork which can normally be converted to an Adobe Illustrator symbol. Then select *Filter > MAP Legend > Create North Arrow* or MAPublisher toolbar button .

Upon creation, the north arrow will be added to the Adobe Illustrator Symbols panel and the coordinate system of the host MAP View will be used to align the north arrow correctly.

When the north arrow symbol is repositioned on the map, it will be re-oriented to the true north at the new location.

NOTE: Sample north arrow designs are included on your MAPublisher CD. Go to *Window > Symbol Libraries > Other Library…* navigate to the *Helpful Styles & Symbols* folder on your CD and load the *MAP_NorthArrows.ai* file. Drag the required symbol onto your Legend layer and then execute the Create North Arrow filter.

** In Adobe Illustrator CS4, Create North Arrow is found in the Object > Filters > MAP Legend menu.*

MAP Web Author

Users are expected to have a basic understanding of HTML syntax to use this feature.

MAPublisher 8 introduces the **MAP Web Author** tool that exports Adobe Illustrator documents with GIS data to interactive Flash maps, fully completed with callout bubbles, rollovers, layer control, pan and zoom controls, and with all the underlying GIS attributes intact.

As with the other MAPublisher functions, MAP Web Author is a completely built-in to Adobe Illustrator. Therefore, users are not required to have Adobe Flash installed to benefit from this tool.

An interactive Web map is exported without any additional coding or software requirements immediately after the map document is created with MAPublisher. All the GIS attribute information can be embedded in callout bubbles.

The resulting Flash map offers controls for the layers visibility. Additionally, specific feature (point, line, and area) can be identified from the attribute information when users type a keyword in a search box.

Users with advanced knowledge in HTML syntax will be able to embed the created Flash map objects to any Web page.

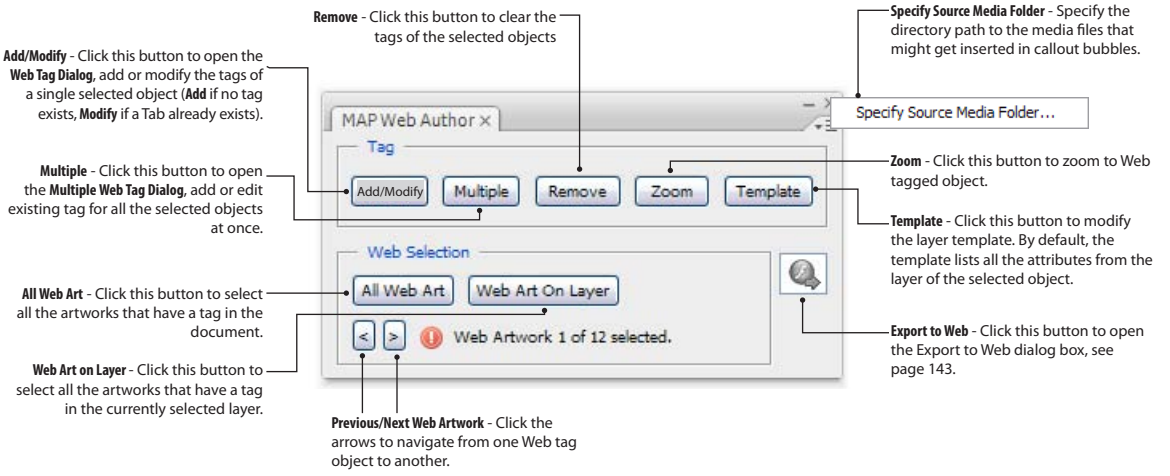
Topics covered in this section are:

MAP Web Author Panel
Web Tag Dialog
Export to Web
MAP Web Author Workflow

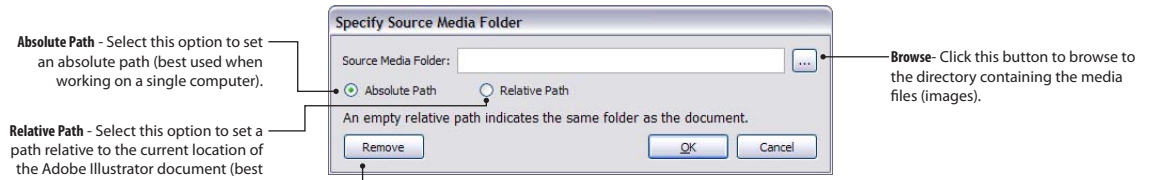
MAP Web Author Panel

Window > *MAPublisher* > *MAP Web Author* or *MAP Toolbar*

MAP Web Author Panel


Remove - Click this button to clear the tags of the selected objects
Specify Source Media Folder - Specify the directory path to the media files that might get inserted in callout bubbles.
Add/Modify - Click this button to open the **Web Tag Dialog**, add or modify the tags of a single selected object (**Add** if no tag exists, **Modify** if a Tab already exists).
MAP Web Author
Specify Source Media Folder...
Tag
Add/Modify
Multiple
Remove
Zoom
Template
Multiple - Click this button to open the **Multiple Web Tag Dialog**, add or edit existing tag for all the selected objects at once.
Zoom - Click this button to zoom to Web tagged object.
Template - Click this button to modify the layer template. By default, the template lists all the attributes from the layer of the selected object.
Web Selection
All Web Art - Click this button to select all the artworks that have a tag in the document.
All Web Art
Web Art On Layer
Web Art on Layer - Click this button to select all the artworks that have a tag in the currently selected layer.
Web Artwork 1 of 12 selected.
Export to Web - Click this button to open the Export to Web dialog box, see page 143.
Previous/Next Web Artwork - Click the arrows to navigate from one Web tag object to another.

Specify Source Media Folder


Absolute Path - Select this option to set an absolute path (best used when working on a single computer).
Specify Source Media Folder
Source Media Folder:
...
Absolute Path
Relative Path
Browse- Click this button to browse to the directory containing the media files (images).
Relative Path - Select this option to set a path relative to the current location of the Adobe Illustrator document (best used when files have to be moved). *Newly created documents must be saved for this option to be enabled.*
An empty relative path indicates the same folder as the document.
Remove
OK
Cancel
Remove- Click this button to clear the current Source Media Folder settings.

FUNCTIONALITY

The **MAP Web Author** tool exports a MAPublisher document as an interactive Flash map for Web display. Together with the map artwork, Web tags (callout bubbles) are exported. Prior to the export process, the **MAP Web Author** panel is used to create, edit, add, or modify these interactive objects.

The Web tags can either be populated one object at the time or for a selection of objects (**Multiple**). The information can be entered manually or extracted from the MAP Attributes fields (when available for the object layer). In **Multiple** Web tagging mode, the same text format is applied to all Web tags. Individual Web tags can be edited later on through the **Modify** dialog box. Text and image formatting is done using simple HTML codes, the results can be checked in the **Callout Preview** window available in the **Web Tag Dialog** (see page 139).

Additional settings are available during the export process (see page 143), such as callout bubble colour, selection colour, etc.

PREREQUISITES

In order to use **MAP Web Author**, you must first complete a map using MAPublisher and Adobe Illustrator tools. The size set for the Adobe Illustrator document will be the size of the Flash map on the Web browser. It is recommended to set the document size before any work is started. However, at a later stage, the document size may be changed in the Adobe Illustrator **Document Setup** dialog box. Using the *Pixels* unit is the most practical to compare with Web browser sizes.

To benefit from the Web tagging based on **MAP Attributes**, the MAP layers must have the relevant attributes populated. For example, to insert links to images using the **Multiple** method, the image file name and path must be set as an attribute value, therefore the MAP layer must have a dedicated attribute field (e.g. house.jpg).

NOTES:

- Not just any map can be made into a Flash Map. A print ready map does not necessarily mean that it is a Flash ready map. Unneeded art and attributes should be removed, lines should be simplified. Layers that do not require tagging will still be exported.
- Only the active artboard will be exported to Flash (Adobe Illustrator CS4 only).

Furthermore, the directory containing the images (**Source Media Folder**) must be organized. The supported image formats are *jpeg, png* and *gif*. To be sure that images can be viewed properly, the latest *Flash Player* version should be installed (download from Adobe website *www.adobe.com*).

When the exported Flash map is viewed without going through a server, you will need to set the *Global Security Settings* as described on page 146.

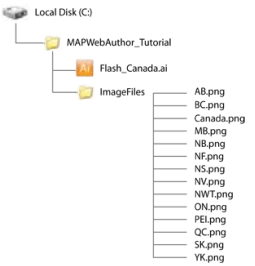
USING MAP WEB AUTHOR

Specify the Source Media Folder

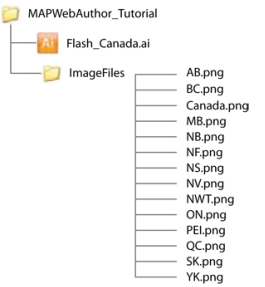
The **Source Media Folder** is the directory containing the images that might be displayed in the Web tags (callout bubbles). The path to this directory must be specified through the **MAP Web Author** panel options menu **Specify Source Media Folder**.

Either an **Absolute Path** or a **Relative Path** may be entered. An Absolute Path refers to the full folder directory path (e.g. *C:\folder1\folder2...*). A Relative Path refers to the folder path from the current location of the Adobe Illustrator document.

Absolute Path example



Relative Path example



If the Adobe Illustrator file is to be exchanged between computers, it is good practice to use a **Relative Path** to avoid having to reset the link to **Source Media Folder** when the files are moved.

Add and Edit Web Tags

The **Web Tag Dialog** is started when clicking the **Add** or **Modify** button. This option is enabled when one single object is selected or several objects from a same layer are selected. See next page for details.

When several objects are selected the **Multiple** button is enabled to allow Web tagging on several objects at once. A click **Multiple** starts the **Multiple Web Tag Dialog**, which is similar to the **Web Tag Dialog,** the only difference is that editions are applied to all selected objects at once. Objects that are tagged with the multiple mode, may be modified individually at a later stage, using the **Modify** button.

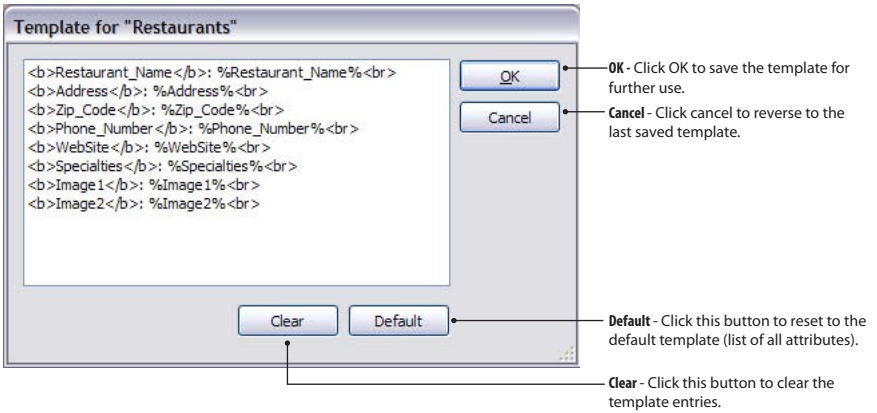
Web Selection

Select all the objects with Web tags (**All Web Art button**) or all objects on the current layer (**Web Art on Layer**). The navigation buttons may be use to highlight objects consecutively.

Create a template

The **Template** button opens a dialog box to create a template that is then accessible from the **Web Tag Dialog** (see next page). By default, the template is set per layer to show the list of all attributes as:

- **Attribute1 Name**: Attribute1 Value
- **Attribute 2 Name**: Attribute2 Value
- etc...

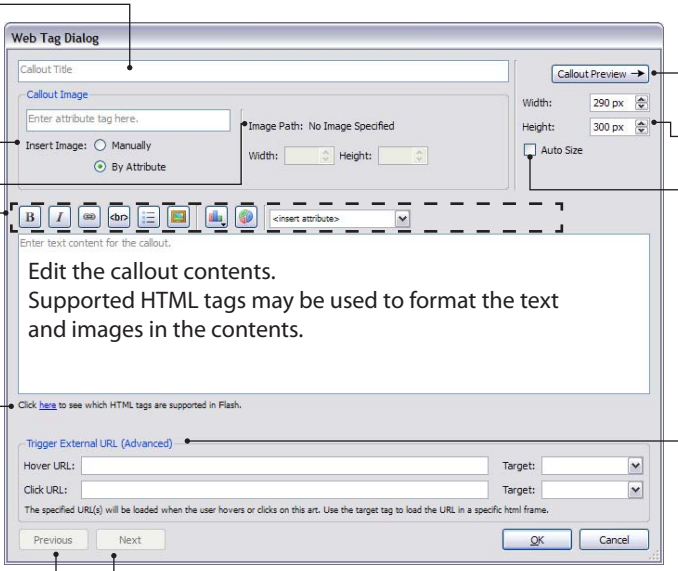

Template for "Restaurants"
Restaurant_Name: %Restaurant_Name%
Address: %Address%
Zip_Code: %Zip_Code%
Phone_Number: %Phone_Number%
WebSite: %WebSite%
Specialties: %Specialties%
Image1: %Image1%
Image2: %Image2%
OK
Cancel
Clear
Default
OK - Click OK to save the template for further use.
Cancel - Click cancel to reverse to the last saved template.
Default - Click this button to reset to the default template (list of all attributes).
Clear - Click this button to clear the template entries.

NOTE: The template is fully editable. It can include attributes, regular text with HTML formatting.

Export to Web

The **Export to Web** button starts the **Web Export Dialog** described in details page 143.

Web Tag Dialog


Web Tag Dialog
Callout Title
Callout Preview
Callout Image
Enter attribute tag here.
Image Path: No Image Specified
Insert Image: Manually
By Attribute
Width:
Height:
290 px
300 px
Auto Size
<insert attribute>
Enter text content for the callout.
Edit the callout contents.
Supported HTML tags may be used to format the text and images in the contents.
Click here to see which HTML tags are supported in Flash.
Trigger External URL (Advanced)
Hover URL:
Click URL:
Target:
The specified URL(s) will be loaded when the user hovers or clicks on this art. Use the target tag to load the URL in a specific html frame.
Previous
Next
OK
Cancel

Callout Title - Type here the title of the callout bubble.

Insert Image -Select **Manually** to browse to the image manually. Select **By Attribute** to type the attribute name containing the path to the image (string type).

Image Width and Height - Specify the image width and height in pixel or use original size.

HTML Text Editor Tools - Use these tools to edit the text (see page 141).

HTML Supported Tags - Click here to open a link to Adobe Web site with Flash documentation on HTML supported tags.

Callout Preview - Click this button to open or close the preview of the callout bubble.

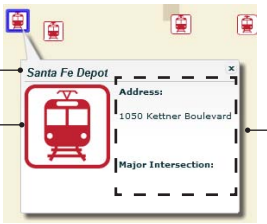
Callout Size - Set the size of the Web tag.

Auto Size - Check this option to have the callout bubble size be automatically set from the image size and text contents.

Trigger External URL (Advanced) - This function allows users to setup properties so that web pages may be opened in a different frame, when either clicking or hovering on a web-art.
The user has to create a set of framesets and target the Web page to a specific frame.

Previous and Next - Click Previous or Next button to switch from one object to another (buttons are enabled when more than one object is selected).

Callout Bubble example:



Callout title.

Callout Image - as set in the image frame.

Callout Contents - can contain text, images and graphics. Set in the contents frame.

FUNCTIONALITY

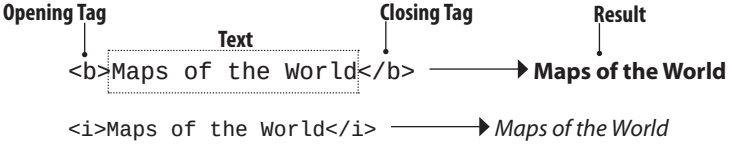
The **Web Tag Dialog** and **Multiple Web Tag Dialog** are started from the **MAP Web Author** panel by clicking the buttons **Add**, **Modify** or **Multiple**. These dialog boxes are meant to design the callout bubbles (also known as Web tag) that will pop-up when clicking objects in the produced Flash map. Not all objects in the map need to be associated with a callout, users must design their Flash maps to make them readable, not too crowded, but still containing the information they wish to display.

NOTE: Objects associated with a callout are also called *Web Art*. Only Web Art will be searchable in the resulting Flash map (see **Export to Web**).

PREREQUISITES

In the **Web Tag Dialog**, text and image parameters are edited using *HTML Tags*. HTML Tags are key codes written between less than (<) and greater than (>) signs, that indicate how the Web browser should display the text. There are opening and closing version for most (but not all) of the tags, and the affected text is contained between two tags. Both the opening and closing tags use the same key code but the closing tag is preceded by an initial extra forward slash sign (/).

Examples of text formatting:



Some HTML tags are used to insert links and images

Examples:

- `<a href="http://www.avenza.com"> Avenza Web Page</a>`
  → Creates a link to www.avenza.com accessed when clicking "Avenza Web Page" text.
- `<img src="sourcemedia/picture.jpg" hspace="0" vspace="0" align="left" >`
  → Inserts an image (picture.jpg located in the **Source Media Folder**).

Besides, HTML ignores extra spaces and returns. Therefore, commands must be used to create line breaks. For example, the key code **
** is used for line break, **<p>** to start a new paragraph. In addition to the HTML tags, MAPublisher can use text extracted from the MAP Attributes table. The reference to the attribute field name is indicated between two percent (**%)** signs: `%Attribute_1%`

Examples use of attribute field:

- `<b>%Street_Name%</b>` → **Main Street**
- `<img src="sourcemedia/%image%" hspace="0" vspace="0" align="left" >`
  → Shows image indicated in the attribute called "image" (a string text). *hspace* and *vspace* set the horizontal and vertical space left blank around the image. *align* set the image alignment to the left of the page
  - `<a href="http://%WebSite%"> Avenza Web</a>`

  → Avenza Web (and opens the Website indicated in the attribute WebSite on click).

Text with HTML tags may be directly entered for formatting or benefit from the **Web Tag Dialog** *HTML Text Editor Tools* described here after.

USING THE WEB TAG DIALOG

Callout Set-up and Preview

The user must set the **Height** and **Width** of the callout bubble in pixel units or use the **Auto Size** option. The **Auto Size** option sets the size of the bubble automatically based on the contents (image and text). The **Preview** button opens or closes the preview of the callout. As text and images are inserted, the preview gets updated to show the aspect of the callout bubble prior to export.

Insert a Title

Callouts may have a title (shown at the top of the bubble as shown in example page 139). The title can be typed in as a simple text, but it can also be formatted using HTML tags and MAP Attribute values.

Insert an Image

Images can be inserted in the callout bubble, on the side of the main contents (see example page 139). To insert an image by browsing to the image file with a file navigator, select **Manually**. To use an attribute value containing the path to the image file, select **By Attribute.** The attribute field name must be entered between percent (%) signs, e.g. %Image_File%.

By default, the original image size is maintained. It is however possible to change it by using the **Width** and **Height** text boxes (the width/height ratio is maintained). This option is not available for **Multiple** tagging with option **By Attribute.**

NOTE: The maximum size for a callout is 1000 pixels x 1000 pixels. When this limit is reached, images are automatically scaled to fit (image aspect ratio is maintained).

Add and Edit Contents

As explained in the *Prerequisites*, the callout bubble text and contents can be typed and formatted using HTML tags. The **Web Tag Dialog** also provides a series of tools to create the HTML tags formatting. It works as follow:

- Type the text or parameter (for image, link and charts)
- Highlight the text
- Click the edit buttons (see below)

The HTML tags are added to the text body . In the **Preview**, the text is shown in the appropriate format and images, links or charts are displayed.

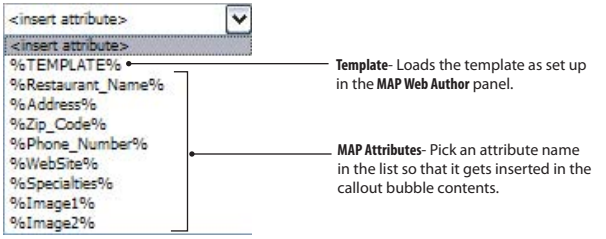
Button	Function	HTML text	Result
	Bold	`<b>bold text</b>`	**bold text**
	Italic	`<i>italic text</i>`	*italic text*
	Hyperlink	`<a href="http://www.avenza.com"> Avenza Page</a>`	Avenza Page
	Break line	`break line`	break line

	List	`<ul>`
		`<li>list 1</li>`
		`<li>list 2</li>`
		`<li>list 3</li>`
		`</ul>`
			list 1
			list 2
			list 3

	Insert image	`<img src="ImageFile/Canada.png">`	

More advanced HTML tags combinations are possible to create more effects. For more information and a complete list of HTML tags supported by Adobe Flash click the link on the Web Tag dialog box or go to *http://livedocs.adobe.com/flash/9.0/main/wwhelp/wwhimpl/common/html/wwhelp.htm?context=LiveDocs_Parts&file=00000922.html*.

Aside from the HTML tags, the **Web Tag Dialog** provides a drop-down list to pick **MAP Attributes** name (visible attributes only) or the **Template** (as set up in the **MAP Web Author** panel).



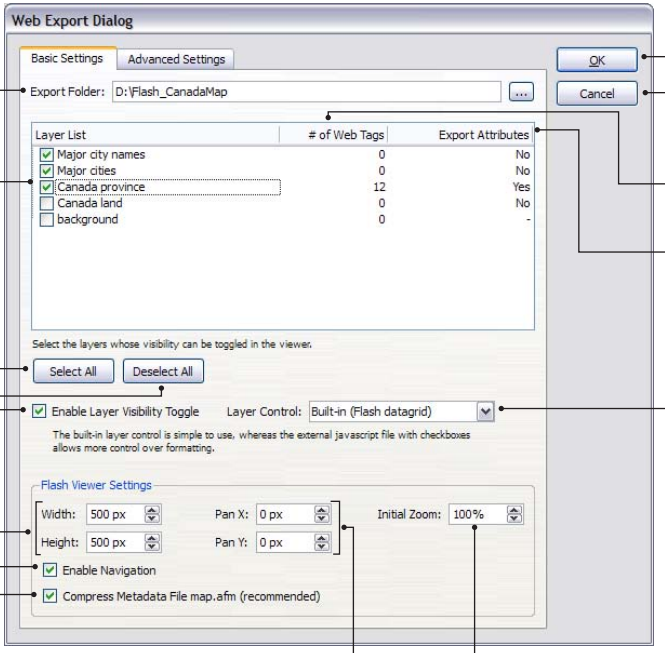
NOTE: MAP Attributes column names are case sensitive.

Auto Size Option

When this option is used, the callout size automatically adapts to the contents and callout image size.

Export to Web

Basic Settings


Web Export Dialog
Basic Settings
Advanced Settings
OK
Cancel
Export Folder: D:\Flash_CanadaMap
Layer List
# of Web Tags
Export Attributes
Major city names 0 No
Major cities 0 No
Canada province 12 Yes
Canada land 0 No
background 0 -
Select the layers whose visibility can be toggled in the viewer.
Select All
Deselect All
Enable Layer Visibility Toggle
Layer Control: Built-in (Flash datagrid)
The built-in layer control is simple to use, whereas the external javascript file with checkboxes allows more control over formatting.
Flash Viewer Settings
Width: 500 px
Height: 500 px
Pan X: 0 px
Pan Y: 0 px
Initial Zoom: 100%
Enable Navigation
Compress Metadata File map.afm (recommended)

Export Folder - Points to the destination folder of the exported Flash Documents.

Layer List - Lists all the layers in the active artboard. Layers are preceded with a check box when the option **Enable Layer Visibility Toggle** is on. All layers will be visible, but only checked layer will be toggable in the Flash map.

Quick Selection Buttons - These buttons are visible when the option **Enable Layer Visibily Toggle** is on, to **Select All** or **Deselect All** layers.

Enable Layer Visibility Toggle - Check this option to add a *Layer Control* box on the Flash map.

Flash Viewer Settings - **Width and Height** - Size of the window of the Flash map in the browser. Cannot be larger than the Adobe Illustrator document .

Enable Navigation - Check this option to display navigations button on the Flash map (pan up/down/left/right and zoom-in/zoom-out).

Compress Metadata File - Check this option to compress the file map.afm (recommended).

Pan X and Pan Y - choose the initial pan shift applied when the Flash map is opened.

Initial Zoom - set the zoom level when the Flash map is initially opened.

OK - Click the button to launch the export to Flash.

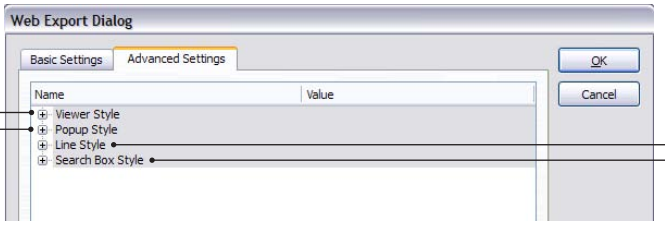
Cancel - Click the button to return to the MAP Web Author panel.

# of Web Tags - Indicates the number of Web tags (callout bubble) created per layer.

Export Attributes - Indicates layers for which MAP Attributes are exported (when used in Web tags).

Layer Control - Select the type of layer control to be inserted in the Flash map:
Build-in (Flash datagrid): layer controls are automatically placed within your Flash document.
External (layerCheckboxes.js): controls are placed externally and can be re-arranged using HTML tags.

Advanced Settings



Viewer Style - Expand to set the Flash viewer style (actions allowed, pan and zoom factors...).

Popup Style - Expand to set the style of the callout bubbles (bubble rounding settings, drop shadow options...).

Line Style - Expand to set the selection and hovering line styles (color, thickness...).

Search Box Style - Expand to set the style of the search box (position, color of searched objects...).

FUNCTIONALITY

The final settings for the export to Flash are entered through the **Web Export Dialog** started from the MAPublisher **MAP Web Author** panel.

While settings concerning the map contents and Web tags are done through the classic MAPublisher tools and the **Web Tag Dialog**, the settings in Web Export concerns the parameters specific to the Flash format: *navigation buttons*, *search box*, *layer controls, callout bubble aspect*...

Navigation buttons - Pan up/down/ left/right
Zoom in (+) and out (-).
Search box - Type in a text. It will search through the contents of all the exported callout bubble.
Canada
Callout Bubble - Style can be edited: corner rounding, drop shadow etc...
NAME: New Brunswick
Population: 723900
CapitalCity: Fredericton
Layer control - Check boxes to toggle on/off layer display. Layer list and position is set in Web Extport Dialog.
Layers
Major city names
Major cities
Canada province
Lines - By default, objects clicked on are highlighted in blue, objects hovered on are in green and objects found by the search are in yellow. Colors are editable.

PREREQUISITE

Web tags must be first setup with the **Web Tag Dialog**.

USING EXPORT TO WEB

The **Web Export Dialog** is started from the **MAP Web Author** panel by clicking the **Export to Web** button .

Layer Control Settings

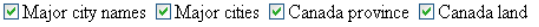
Users may choose to insert a *Layer Control* panel into the Flash map. To do so, the option **Enable Layer Visibility Toggle** must be checked. Layers that are checked in the **Layer List** will be included as toggable in the *Layer Control*. The layers that are not checked are exported, but it will not be possible to switch them on and off of the display when the Flash map is opened in a Web browser.

In general, the layers display order is the same as setup in Adobe Illustrator. However toggable layers will be displayed at the top of the non-toggable layers.

The style of the Layer Control is set through the **Layer Control** list box. The two styles options are:

- *Built-in (Flash Datagrid):* the control is automatically placed on the Flash document and cannot be modified.

- *External (layerCheckboxes.js):* Check boxes are placed outside the Flash map. The great advantage of this option is that the position and layout of the check boxes can be re-arranged using HTML tags. By default, they are placed at the top of the Flash map:



Flash Viewer Settings

Users can setup the following parameters for the Flash Viewer (how the Flash map will be displayed when opened in the Web browser). The parameters that can be setup are:

- Size of the display window (width and height), it cannot be larger than the Adobe Illustrator document.
- Initial position of the Flash map of the display (pan X and pan Y shift, initial zoom).
- Display of the navigation buttons or not.

Users can also make some more advanced changes to the default display settings, such as:

- *Viewer style:* enable only some of the navigation buttons, change the zoom and pan factors, change the button positions...
- *Popup style:* change the rounding of the callout bubble, arrow style, change the drop shadow settings and position...
- *Line style:* change the color and thickness of line marking clicked and hovered objects...
- *Search box style:* enable or display of the search box, change the default position, change the color and thickness of the line marking the objects found by the search.

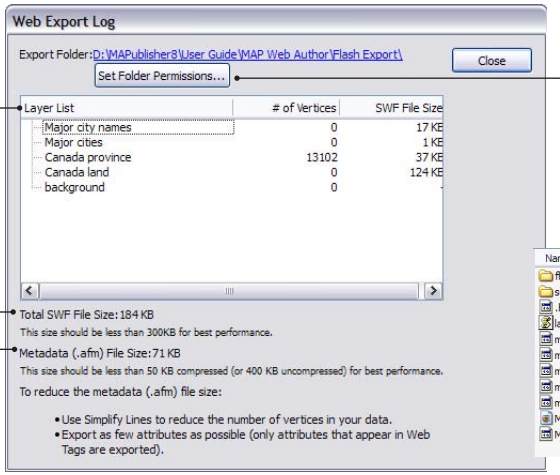
Execute Web Export

Once all the settings are entered, the user launches the actual export to Flash by clicking the **OK** button.
The export summary is displayed in the **Web Export Log**.

The export creates a set of indispensable default files together with the files specific to the map. The specific files are:

- *map.afm* (or *map.afm.compressed* when the compress option is checked)
- *MAPublisherSWF.swf*
- *map.swf* plus *map_L1.swf, map_L2.swf*... (one file per selected toggable layer when the option is selected).

Web Export Log

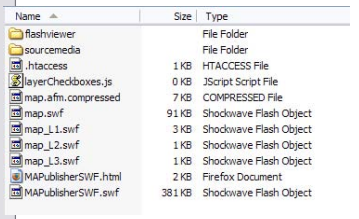

Web Export Log
Export Folder: D:\MAPublisher8\User Guide\MAP Web Author\Flash Export\
Close
Set Folder Permissions...
Layer List
# of Vertices
SWF File Size
Major city names 0 17 KB
Major cities 0 1 KB
Canada province 13102 37 KB
Canada land 0 124 KB
background 0 -
Total SWF File Size: 184 KB
This size should be less than 300KB for best performance.
Metadata (.afm) File Size: 71 KB
This size should be less than 50 KB compressed (or 400 KB uncompressed) for best performance.
To reduce the metadata (.afm) file size:
• Use Simplify Lines to reduce the number of vertices in your data.
• Export as few attributes as possible (only attributes that appear in Web Tags are exported).

Layer List - List of the exported layers, number of vertices and size.

Total SWF File Size - Indicates the total size of the created swf file. The smaller the better 50 KB afm compressed is ideal

Metadata (.afm) File Size - Indicates the size of the created afm file.

Set Folder Permissions - In order to view your Flash document with an internet browser, Permissions must be set to the Export Folder (see below).


Name
Size
Type
flashviewer File Folder
sourcemedia File Folder
.htaccess 1 KB HTACCESS File
layerCheckboxes.js 0 KB JScript Script File
map.afm.compressed 7 KB COMPRESSED File
map.swf 91 KB Shockwave Flash Object
map_L1.swf 3 KB Shockwave Flash Object
map_L2.swf 1 KB Shockwave Flash Object
map_L3.swf 1 KB Shockwave Flash Object
MAPublisherSWF.html 2 KB Firefox Document
MAPublisherSWF.swf 381 KB Shockwave Flash Object

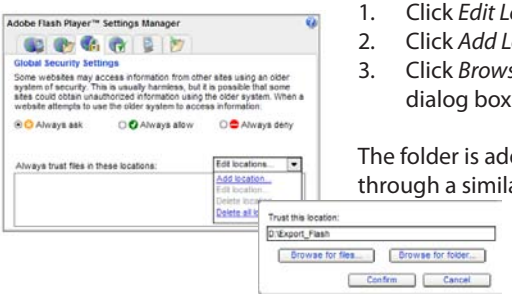
List of created files - Export Folder.

The **Web Export Log** information on the file size is meant to warn the users when files get very large. Large files should be avoided as they may be very slow to open on a Web site.

Visualize Results

In order to view the produced Flash map on a regular Web browser, **without posting the file on a server**, some permissions (*Global Security Settings*) must be set to allow the browser to open the file.

Clicking the **Set Permissions** button in the **Web Export Log** dialog box, opens the Web page *http://www.macromedia.com/support/documentation/en/flashplayer/help/settings_manager04.html* containing the *Adobe Flash Player Settings Manager*:


Adobe Flash Player™ Settings Manager
Global Security Settings
Some websites may access information from other sites using an older system of security. This is usually harmless, but it is possible that some sites could obtain unauthorized information using the older system. When a website attempts to use the older system to access information:
Always ask
Always allow
Always deny
Always trust files in these locations:
Edit locations...
Add location...
Edit location...
Delete location...
Delete all locations...
Trust this location:
D:\Export_Flash
Browse for files...
Browse for folder...
Confirm
Cancel

1. Click *Edit Locations*
2. Click *Add Location*
3. Click *Browse For Folder* or copy the full path as written in the **Web Export Log** dialog box and click *Close*.

The folder is added in the list of trusted location. Locations can later be deleted through a similar process

NOTE: You must be connected to the Internet in order to set these permissions

To finally view the exported map, browse to the Flash export folder (as specified in the **Web Export Dialog**) and open the file *MAPublisherSWF.html* in your favorite Web browser. Users should be reminded to check that the latest *Flash Player* version has been installed (download from Adobe Web site). An outdated viewer might cause images not to be displayed (gif format in particular).

MAP Web Author Workflow

MAPublisher 8 is installed with tutorial materials. It is recommended that users go through the exercises described in them in order to get more familiarity with the tools. The tutorial materials have an exercise dedicated to the new **MAP Web Author** panel. Users can also refer to this chapter that presents a general workflow to be used for guidance.

1) MAP COMPILATION WITH ADOBE ILLUSTRATOR / MAPUBLISHER 8

Users must create their map document using the traditional MAPublisher 8 and Adobe Illustrator tools.
If the only purpose of the map is to create a Flash map, consider at this stage the document size parameter, as this determines the size of map extents in the Web browser.

2) PREPARING FOR MAP WEB AUTHOR

a) Creating a working directory

Create a folder in your computer. This folder is to store all the components for the Web Flash map and the exported Flash files.

b) Preparing images for the callouts

Images that will be used in the Web tagging process must be collected and grouped in a folder (**Source Media Folder**).

If you plan to insert the images using a **MAP Attributes** field in the **Multiple** mode, remember that you will not be able to change the sizes in the **Web Tag Dialog.** If required, image sizes have then to be changed in a picture editor first.

c) Setting document size for the Flash map

If the document size hasn't been set at step one (document creation), it should be modified through the Adobe Illustrator menu *File* > *Document Setup* prior to the Web export.

NOTE: Changing the document size might induce additional edition of the symbol and text sizes as well as stroke widths.

d) Attribute table information to attach the callouts

In order to use attributes information for Web tagging, they must be organized using the MAPublisher **MAP Attributes** panel.
This process might include creating new attribute columns to type Web site links or image file path (in that case create a column of type String).

e) Data preparation

Run the crop tool, simplify lines and remove unneeded attributes.

3) USING MAP WEB AUTHOR

a) Setup the Source Media Folder

The user have a choice between entering an *absolute* or *relative* path for the **Source Media Folder**.

Example: Absolute path: *C:\Work\Flash_Project\Images*
Relative path: *\Images*

NOTE: If an image is placed under *C:\Work\Flash_Project\Images\MyImage\MyImage1.jpg*, and the Source Media Folder is *C:\Work\Flash_Project\Images*, then the path *\MyImage\MyImage1.jpg* must be typed in the **Web Tag Dialog** (or in the **MAP Attributes** panel when using attributes).

b) Creating callout bubbles

Using the **Web Tag Dialog** (described page 139)**,** insert the information relative to the callout bubbles (title, images, text contents etc...).

When **MAP Attributes** have been prepared for some layers, users may first select all objects in one layer and choose the **Multiple** tagging mode. Use the **Preview** to check the aspect of the callout bubble prior to the export process. When tagging multiple objects, use the buttons *Next/Previous* to display the bubble created for each individual objects.

4) EXPORT FLASH DOCUMENTS

The settings entered in the **Web Export Dialog** are determined by the desired aspect of the Web map. See details in page 143. We recommend users to tryout the different configurations. Here are some simple examples:

Simple MAP - No layer control, no navigation (*Basic Settings*). No Search box (*Advanced Settings*).

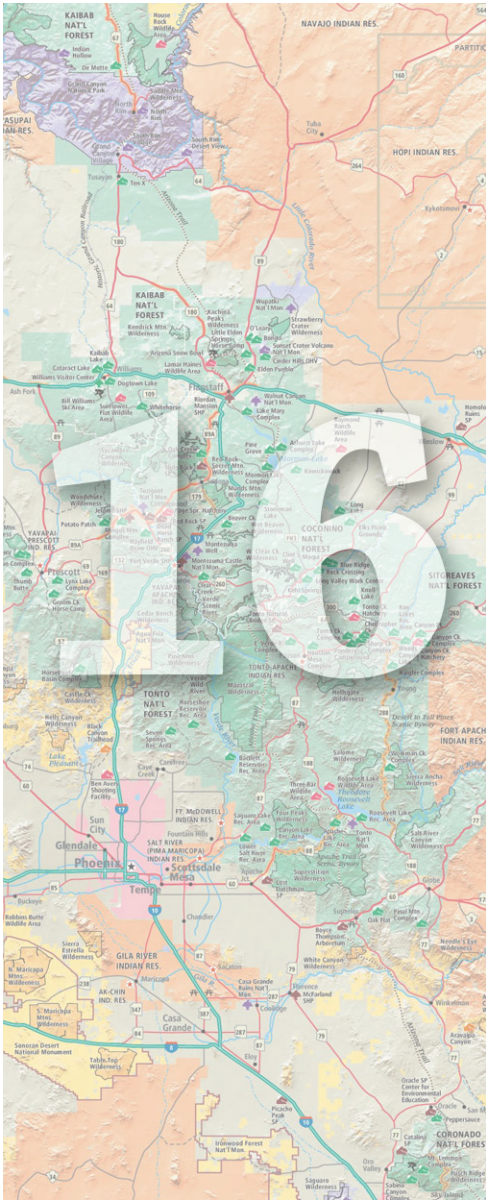
Default Style Map - Built-in layer control and navigation button added through the *Basic Settings* only.
No *Advanced Settings* required.

Customized Style Map - External layer control and navigation button added through the *Basic Settings*. Removed zoom buttons and changed callout bubble style through *Advanced Settings*.

5) VIEWING THE FLASH MAP WITH A WEB BROWSER.

To view the Flash map with a Web browser, without posting the files on a server, users must first set the Global Security Settings (see page 146).

Users should also download the latest Flash Player version for their Web browser. It can be downloaded free of charge from Adobe Web site (*www.adobe.com*).



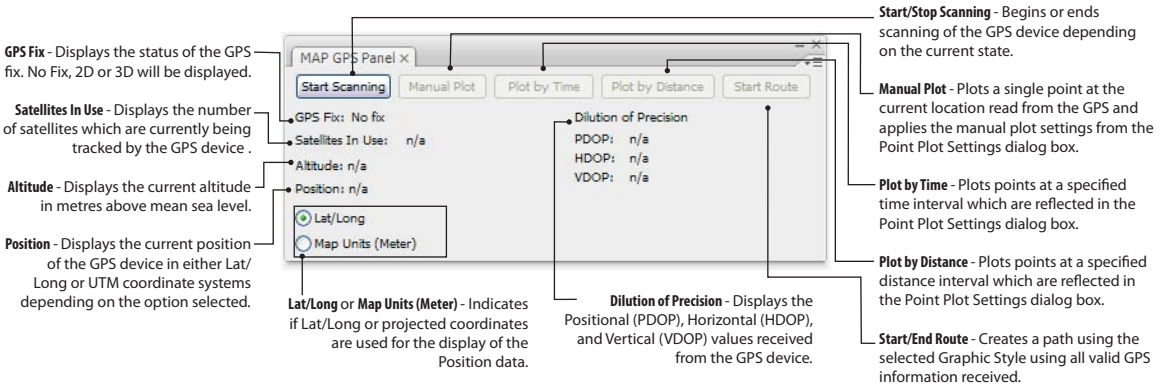
MAP GPS

The MAP GPS feature allows for the collection, display and styling of raw GPS data directly in Adobe Illustrator. Using the MAP GPS feature, you can connect to many NMEA compliant GPS devices, collect data points and then use the information to apply it to maps. The data can be reprojected, styled, and scaled automatically when it is received.

The **MAP GPS Panel** is covered in this section.

MAP GPS Panel

Window > MAPublisher > MAP GPS Panel or *MAP Toolbar*


MAP GPS Panel
Start Scanning
Manual Plot
Plot by Time
Plot by Distance
Start Route
GPS Fix: No fix
Satellites In Use: n/a
Altitude: n/a
Position: n/a
Lat/Long
Map Units (Meter)
Dilution of Precision
PDOP: n/a
HDOP: n/a
VDOP: n/a
GPS Fix - Displays the status of the GPS fix. No Fix, 2D or 3D will be displayed.
Satellites In Use - Displays the number of satellites which are currently being tracked by the GPS device .
Altitude - Displays the current altitude in metres above mean sea level.
Position - Displays the current position of the GPS device in either Lat/Long or UTM coordinate systems depending on the option selected.
Lat/Long or Map Units (Meter) - Indicates if Lat/Long or projected coordinates are used for the display of the Position data.
Dilution of Precision - Displays the Positional (PDOP), Horizontal (HDOP), and Vertical (VDOP) values received from the GPS device.
Start/Stop Scanning - Begins or ends scanning of the GPS device depending on the current state.
Manual Plot - Plots a single point at the current location read from the GPS and applies the manual plot settings from the Point Plot Settings dialog box.
Plot by Time - Plots points at a specified time interval which are reflected in the Point Plot Settings dialog box.
Plot by Distance - Plots points at a specified distance interval which are reflected in the Point Plot Settings dialog box.
Start/End Route - Creates a path using the selected Graphic Style using all valid GPS information received.

FUNCTIONALITY

MAP GPS will collect, interpret, and apply styles to points and lines from information received from a supported GPS device within an Adobe Illustrator document, based on user settings.

Several plotting options are available for use in MAP GPS. For plotting points, users can decide whether to plot single points using the **Manual Plot** option, to plot points based on a specific time interval, or to plot points based on a set distance interval. For plotting lines, the **Start Route** feature may be used to create a line feature containing all valid information received from the GPS device.

Additionally, auxiliary settings may be used to plot points on separate layers when either a change in speed or a change in heading is observed, when concurrently using one of the previously mentioned plotting options.

MAP GPS also provides the ability to automatically apply user defined attributes for specific layers while plotting, and to record a log file of information received from the GPS device, which may then be played back into an Adobe Illustrator document at a later time.

PREREQUISITES

Prior to being able to use MAP GPS, it is required to have a compatible GPS receiver. Supported devices include any NMEA compliant device which has either serial, USB, and/or Bluetooth connection options. Prior to interacting with the GPS device, the proper settings must be specified in the **Device Settings** dialog box so that the GPS can communicate and interact with the MAP GPS software.

Either a new document or an existing document may be used to begin a GPS session. If the appropriate type of layer is selected in the layers panel e.g. a point layer, then points will be plotted on that layer. If no layer or an improper layer for the type of plotting action is selected then a new layer will automatically be created of the proper type.

USING THE MAP GPS PANEL

Start Scanning

This feature allows MAPublisher to interact with the specified GPS device. When the **Start Scanning** button is clicked, the settings specified in the **Device Settings** dialog box will be used to begin reading and interpreting the information the GPS is receiving. This information is then used to display the GPS status in the GPS panel as well as to plot points and/or lines.

Manual Plot

This method plots a single point at the current position reported by the GPS device. The plotted point is reflective of the settings specified under the **Manual Plot** section of the **MAP GPS Point Plot Settings** panel, i.e. using the specified scale and point symbol. When **Manual Plot** is clicked, a single point will be plotted either on an existing point layer (if selected) or on a new layer which is automatically created if a point layer is not selected. If the Adobe Illustrator document does not contain any MAP View, a new one is created in the WGS84 geodetic coordinate system.

Plot By Time

This method plots a single point each time the specified time interval is observed. The time interval is displayed in the **MAP GPS Point Plot settings** panel along with other settings such as scale and point symbol.

Plot By Distance

This method plots a single point each time the specified distance interval is observed. The distance interval is displayed in the **MAP GPS Point Plot settings** panel along with other settings such as scale and point symbol.

Start Route

This method creates a line feature for all valid information received by the GPS. Line styling is determined by the Graphic Style selected in the Adobe Illustrator *Graphic Styles* panel.

MAP GPS Panel Menu

Accessed from the MAP GPS Panel

Many of the **MAP GPS** features can be accessed via the MAP GPS panel options menu. These features include **Device Settings**, **Point Plot Settings**, **Autosave Settings**, **Edit User Attribute,** as well as many different log file features. The following sections will outline each of the features and their uses.

Device Settings - Opens the *Device Settings* dialog box.

Point Plot Settings - Opens the *Point Plot Settings* dialog box.

Autosave Settings - Opens the *Autosave Settings* dialog box.

Edit User Attribute for Current Layer - Opens the Edit *User Attribute for Current Layer* dialog box.

Record Sentence Log - Opens the *Record Sentence Log* dialog box.

View Sentence Log - Opens the *View Sentence Log* panel.

Playback Sentence Log - Opens the *Playback Sentence Log* panel.

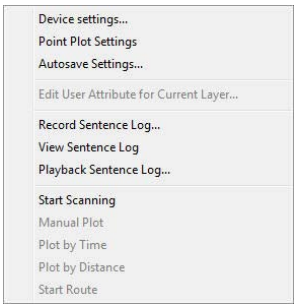
Start Scanning - Begins Scanning the GPS device.

Manual Plot - Plots a single point.

Plot by Time - Begins plotting points by a specified time.

Plot by Distance - Begins plotting points by a specified distance

Start Route - Begins plotting a route.



MAP GPS DEVICE SETTINGS

Accessed from the MAP GPS menu.

The **MAP GPS Device Settings** dialog box provides for the input of the specific settings for the connected GPS Device. Users are required to manually select the appropriate settings prior to using MAP GPS. Appropriate settings for specific devices can usually be obtained by consulting the device's user manual or by contacting the manufacturer.

Port Name - Select the proper serial port for your GPS device.

Baud Rate - Select the baud rate for your GPS device.

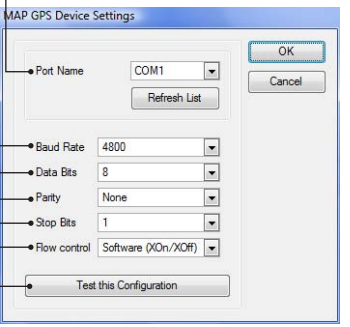
Data Bits - Select the data bits for your GPS device.

Parity - Select the proper parity for your GPS device.

Stop Bits - Select the proper Stop Bits for your GPS device.

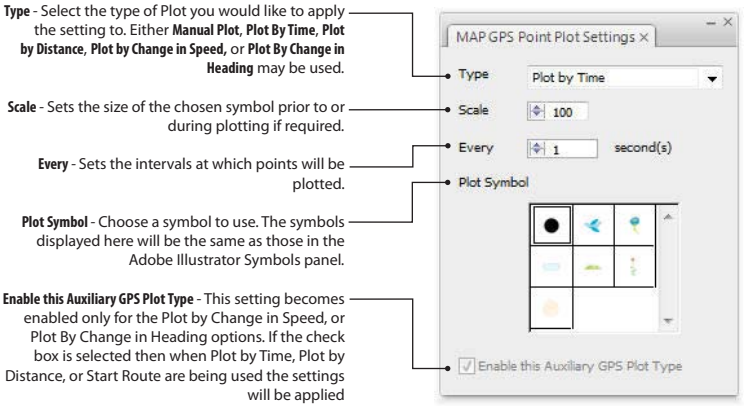
Flow Control - Select the proper flow control for your GPS device.

Test this Configuration - Select button to ensure all the specified features are inputted correctly before continuing.



MAP GPS Point Plot Settings

Accessed from the MAP GPS menu.


Type - Select the type of Plot you would like to apply the setting to. Either **Manual Plot**, **Plot By Time**, **Plot by Distance**, **Plot by Change in Speed,** or **Plot By Change in Heading** may be used.
Scale - Sets the size of the chosen symbol prior to or during plotting if required.
Every - Sets the intervals at which points will be plotted.
Plot Symbol - Choose a symbol to use. The symbols displayed here will be the same as those in the Adobe Illustrator Symbols panel.
Enable this Auxiliary GPS Plot Type - This setting becomes enabled only for the Plot by Change in Speed, or Plot By Change in Heading options. If the check box is selected then when Plot by Time, Plot by Distance, or Start Route are being used the settings will be applied
MAP GPS Point Plot Settings
Type
Plot by Time
Scale
100
Every
1
second(s)
Plot Symbol
Enable this Auxiliary GPS Plot Type

FUNCTIONALITY

The MAP GPS **Point Plot Settings** panel is used for controlling all of the settings related to points to be plotted by the GPS. In this dialog box, users define parameters such as scale, interval, and point symbol. The **Point Plot Settings** panel also controls the additional auxiliary settings such as change in speed and change in heading. Point symbols reflect the symbols found in the Adobe Illustrator **Symbols** panel. New symbols created or loaded in the Adobe Illustrator Symbols panel will be appended to the MAP GPS Point Plot Settings panel.

Use the **Type** drop-down list to enter the settings for **Manual Plot, Plot By Time, Plot by Distance, Plot by Change in Speed** or **Plot by Change in Heading.**

USING THE POINT PLOT SETTINGS PANEL

Manual Plot

The **Manual Plot** setting option controls how points will be plotted and styled when using the Manual Plot option from the main MAP GPS panel. There are two settings for the Manual Plot, the Scale and Plot symbol. The scale controls the size of the point symbol to be plotted. With a scale of 100 percent selected, the point is plotted at the original size of the symbol. The second option is the **Plot Symbol** which determines which symbol is plotted.

Plot By Time

The **Plot By Time** setting options control how points will be plotted when using the Plot By Time feature from the main MAP GPS panel. Three separate settings can be adjusted: **Scale**, **Every** and **Plot symbol**. The **Every** setting is used to specify the time interval between plots. For instance, if the **Every** setting is set to 5 seconds, a new point is plotted every five seconds. These settings may be changed while plotting is occurring. If the user wishes to increase or decrease the scale or change to a different point symbol while plotting by time, they may do so by setting new parameters. Changes will be reflected in the next point to be plotted.

Plot By Distance

The **Plot by Distance** setting options control how points will be plotted when using the Plot by Distance feature from the main MAP GPS panel. Three separate settings can be adjusted: **Scale**, **Every** and **Plot symbol**. The **Every** setting is used to specify the distance interval between plots. For example, if the **Every** setting is set to 5 metres, a point will be plotted every five metres. These settings may be changed while plotting is occurring. If the user wishes to increase/decrease the scale or change to a different point symbol while plotting by distance, they may do so by simply selecting new parameters. Changes will be reflected in the next point to be plotted.

Plot By Change in Speed

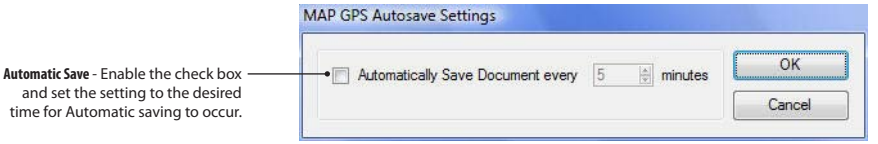
The **Plot by Change in Speed** auxillary settings will plot a point each time a change in speed is detected as specified by the threshold set in the **Point Plot Settings**. Change in speed points are plotted in addition to the points plotted while completing one of the standard plot options (**Plot by Time**, **Plot By Distance** or **Route**). To use this setting, a user must first enable it by selecting the **Enable this Auxillary GPS Plot Type** from the bottom of the MAP GPS Point Plot Settings panel. The optional settings for **Scale**, **Every**, and **Plot Symbol** must then also be specified. The **Every** setting has an additional option which allows specification of the speed units. Either km/h, knots, or mi/h may be used. When plotting begins, a new layer is automatically be created specifically for the change in speed points. This layer will be automatically named based on the name of the current layer upon which the main plotting operation is being conducted with the phrase **change_in_speed** prefixed to it. For example if the main plotting is in progress on a layer called *ABCD,* the layer created for the change in speed plots will be named *change_in_speed_ ABCD*.

Plot By Change in Heading

The **Plot by Change in Heading** auxillary settings will plot a point each time a change in heading is detected as specified by the threshold set in the **Point Plot Settings**. Change in heading points are plotted in addition to the points plotted while completing one of the standard plot options (**Plot by Time**, **Plot By Distance** or **Route**). To use this setting a user must first enable it by selecting the **Enable this Auxillary GPS Plot Type** from the bottom of the MAP GPS Point Plot Settings panel. The optional settings for **Scale**, **Every**, and **Plot Symbol** must then also be specified. When plotting begins, a new layer will automatically be created specifically for the change in heading points. This layer will be automatically named based on the name of the current layer upon which the main plotting operation is being conducted with the phrase **change_in_heading_** prefixed to it. For example if the main plotting is in progress on a layer called *ABCD,* the layer created for the change in heading plots will be named *change_in_heading_ ABCD*.

MAP GPS Autosave Settings

Accessed from the MAP GPS menu.


MAP GPS Autosave Settings
Automatic Save - Enable the check box and set the setting to the desired time for Automatic saving to occur.
Automatically Save Document every
5
minutes
OK
Cancel

FUNCTIONALITY

The **MAP GPS Autosave Settings** provide the option to have a document automatically saved each time a specified time interval has elapsed. This feature allows for users to limit data loss in the instance that hardware or power problems occur while collecting data.

PREREQUISITES

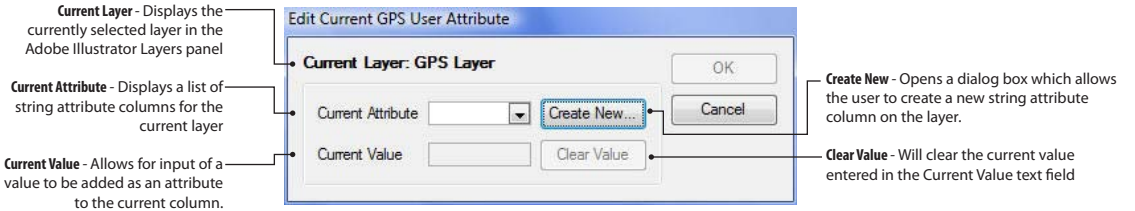
The current document must have already been saved at least once to a local location on the computer. If the **Autosave** setting is activated and the current document has not been saved then a warning will appear upon leaving the **Autosave** dialog box, stating that this feature will not function until the document is saved and will offer the option to manually save the document at that time.

USING THE AUTOSAVE SETTINGS

The **Autosave** settings may be activated by selecting the associated check box and specifying the number of minutes between autosave instances. Once this has been activated and the current document has been saved, automatic saves will occur each time the specified interval is reached.

Edit User Attribute for Current Layer

Accessed from the MAP GPS menu.


Current Layer - Displays the currently selected layer in the Adobe Illustrator Layers panel
Current Attribute - Displays a list of string attribute columns for the current layer
Current Value - Allows for input of a value to be added as an attribute to the current column.
Edit Current GPS User Attribute
Current Layer: GPS Layer
OK
Current Attribute
Create New...
Cancel
Current Value
Clear Value
Create New - Opens a dialog box which allows the user to create a new string attribute column on the layer.
Clear Value - Will clear the current value entered in the Current Value text field

FUNCTIONALITY

The **Edit Attribute for Current Layer** dialog box provides the ability to create a new attribute column for the current layer or use an existing string (text) attribute column and have custom attribute values automatically entered in that column for plotted features. Attribute values will be added each time a new point is plotted. For example, if points are being plotted along a street, a *Street* column could be created and the street name could be added as an automatic attribute value each time a new point is plotted.

PREREQUISITES

Prior to using this feature the current document requires a MAP View and at least one MAP layer. If the MAP layer is selected then the **Edit User Attribute for Current Layer** is accessible and can be set up for use when plotting begins. If the above criteria are not met the **Edit User Attribute for Current Layer** menu item will be greyed out and unavailable.

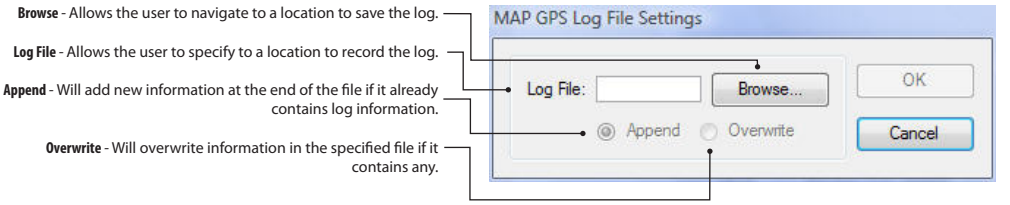
USING THE EDIT USER ATTRIBUTE FOR CURRENT LAYER

The **Edit User Attribute For Current Layer** function can be accessed whenever a valid MAP layer is selected. Upon opening the dialog box, the current layer name will be displayed in the dialog box along with any string attribute column names associated with that layer. To add attribute values to an existing attribute column select the desired column name from the **Current Attribute** combo box and enter the desired attribute value into the **Current Value** text field. To create a new column select the **Create New** button and enter a column name into the open dialog box. When a new attribute column is created its type will be automatically set to **string**. When the dialog box closes and plotting begins, the attribute value will be added to the layer each time a point is plotted.

NOTE: If the **Edit User Attribute For Current Layer** dialog box is opened while plotting is in progress, the plotting will be paused. This allows the necessary changes to be made. Upon closing the dialog box all the points which would have been plotted will be plotted and will reflect the changes just made.

Record Sentence Log

Accessed from the MAP GPS menu.


Browse - Allows the user to navigate to a location to save the log.
Log File - Allows the user to specify to a location to record the log.
Append - Will add new information at the end of the file if it already contains log information.
Overwrite - Will overwrite information in the specified file if it contains any.
MAP GPS Log File Settings
Log File:
Browse...
OK
Append
Overwrite
Cancel

FUNCTIONALITY

The **Record Sentence Log** feature allows for all information gathered from the GPS to be saved to a text file. This information can be used for back-up or debugging purposes or imported at a later time into a new document. In addition to being able to record to the file, the user is given the options of adding to an existing file or overwriting any information which may be in the specified file.

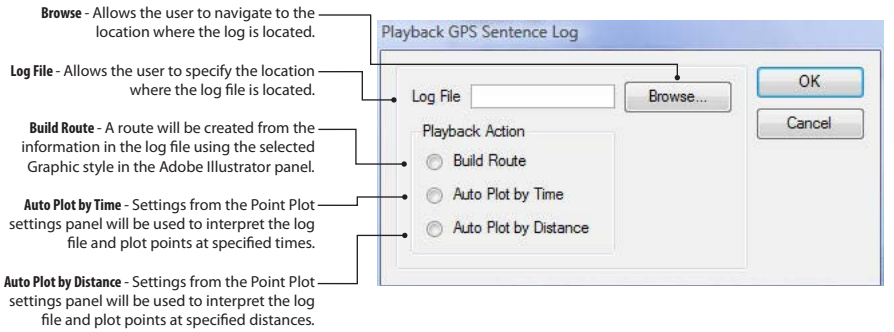
USING THE RECORD LOG SETTINGS DIALOG BOX

The **Record Log Settings** dialog box requires either navigation to a directory or manual specification of a location to which the log file is to be saved. Once a directory has been specified the file name for the Record Log must be specified. This file will be saved as a standard text file that is readable in *Notepad* or any other plain text capable application. It may also be used at a later date to import the log information into a new or existing document as MAP features. In addition to specifying a file name and location either the **Append** option or the **Overwrite** option must be specified. The **Append** option will add all new information to the end of the file if the selected file contains information. The **Overwrite** option will overwrite any information currently contained in the specified file with the new information received.

NOTE: Once a *Record Log* file has been specified using the **Overwrite** option and plotting started, any interruption to the plotting, for example, evoking a **Stop Scanning** operation, will result in the saved log file being overwritten by new log data once scanning and plotting restart. If it is desired that a complete session log be created and saved which is not overwritten each time plotting is stopped and restarted, the **Append** option should be used.

Playback Sentence Log

Accessed from the MAP GPS menu.


Browse - Allows the user to navigate to the location where the log is located.
Log File - Allows the user to specify the location where the log file is located.
Build Route - A route will be created from the information in the log file using the selected Graphic style in the Adobe Illustrator panel.
Auto Plot by Time - Settings from the Point Plot settings panel will be used to interpret the log file and plot points at specified times.
Auto Plot by Distance - Settings from the Point Plot settings panel will be used to interpret the log file and plot points at specified distances.
Playback GPS Sentence Log
Log File
Browse...
OK
Cancel
Playback Action
Build Route
Auto Plot by Time
Auto Plot by Distance

FUNCTIONALITY

The **Playback Sentence Log** feature allows for information contained in a log file to be re-imported into an Adobe Illustrator document. The **Playback Sentence Log** feature is used in conjunction with the MAP GPS Point Plot Settings panel to create a series of points or a route in the document based upon data previously collected using MAP GPS. Depending on the applied settings, GPS sessions which have been previously recorded can be recreated in a new or existing document. This feature may also be used to import raw NMEA files collected from other devices.

USING THE PLAYBACK SENTENCE LOG DIALOG BOX

The **Playback Sentence Log** feature is used by selecting a previously recorded log file and then selecting one of the plot options: **Build Route**, **Auto Plot by Time**, or **Auto Plot by Distance**.

- **Build Route** - A route will be created from the information in the log file using the selected *Graphic style* in the Adobe Illustrator panel.
- **Auto Plot by Time** - Settings from the Point Plot settings panel will be used to interpret the log file and plot points at specified times.
- **Auto Plot by Distance** - Settings from the Point Plot settings panel will be used to interpret the log file and plot points at specified distances.

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Appendix 1: Technical Reference Guide

Graphic File Formats

AI
The *Adobe Illustrator* native postscript file format. Refer to the Adobe Illustrator User Guide for more information.

DOQ
Digital Orthophoto Quadrangle (DOQ) are geographic images from the United States Geological Survey (USGS) and are stored in the JPG format. They can be placed by Adobe Illustrator and registered by the MAPublisher Register Image filter. DOQ are usually very large files (30-40 MB or more) and will require extremely large amounts of RAM.

DRG
Digital Raster Graphics (DRG) are scanned images of published topographic maps from the USGS stored in TIF format. They can be placed by Adobe Illustrator and registered by the MAPublisher Register Image filter. DRG are also usually very large files (30-40 MB or more) and will require extremely large amounts of RAM for any manipulation within Adobe Illustrator.

EPS
The *Encapsulated Post Script* (EPS) file is used to transfer PostScript language artwork between applications (also see PostScript in the glossary section of the User Guide). EPS files are easily opened by Adobe Illustrator because the format is widely supported by most graphics programs. It is the preferred format for export to most illustration and page-layout programs. EPS files are by their nature vector based, but can contain embedded raster graphics and fonts.

GIF
Graphic Interchange Format (GIF) is a colour-indexed graphics format, commonly used for web pages and image file transfer. Adobe Illustrator can export 8-bit indexed-colour or grayscale gifs.

JPEG
Joint Photographic Experts Group (JPEG or JPG) is a compression technique for raster file formats. The Digital Orthophoto Quadrangle geographic images from the USGS are stored in this format, which can be imported by Adobe Illustrator and registered by the MAPublisher Register Image filter. DOQ are usually very large files (30-40 MB or more) and will require extremely large amounts of RAM.

PDF
Portable Document Format (PDF) is a standardized format developed by Adobe for use across Macintosh, Windows, DOS, and UNIX platforms. Based on the PostScript Level 2 language, PDF supports both raster and vector graphics.

TIF/TIFF/GEOTIFF
Tagged Image File Format (TIFF or TIF) is a common raster graphic file format that can be imported by Adobe Illustrator. Many raster geographic images from GIS systems are stored in this format, which can be imported by Adobe Illustrator and registered by the MAPublisher Register Image filter. A GeoTIFF is a TIFF file with embedded geographic information identifying its position and scale in world coordinates.

OTHERS
Please refer to the Adobe Illustrator User Guide for other graphics file formats supported by Adobe Illustrator.

MAPublisher Import Formats

This section contains descriptions of the GIS formats supported for import by MAPublisher. Here you will find an overview of the structure of each format, as well as information on supported format versions and elements unique to each data type. Each file format will carry a checklist covering which core elements are supported by MAPublisher during its import. You can also refer to the Frequently Asked Questions section in this guide for information on any issues associated with the various file formats.
Also see chapter 2 on Map Data File Formats.

AUTOCAD DRAWING (*DWG) AND DRAWING EXCHANGE (*.DXF)

There are two formats used by AutoCAD: DXF is a CAD data file format, developed by Autodesk as their solution for enabling data interoperability between AutoCAD and other programs. The Dwg format is used for storing two and three dimensional design data and is the internal format for the AutoCAD Computer Aided Design package. DWG is also the common name for AutoCAD proprietary DWG technology developed by Autodesk for their AutoCAD package.

Supported Elements	
Typical File Extensions	*.dwg, *.dxf
Automated Translation	Yes
User-Defined Attributes	Yes
Coordinate System Support	No
Generic Colour Support	Yes
Spatial Index	Never
Schema Required	Yes
3D Support	Yes

Supported Geometry	
Aggregate	No
Circles	Yes
Circular Arc	Yes
Elliptical Arc	Yes
Ellipses	Yes
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	Yes

Supported Versions
Windows: Releases vrs. R12 to 2007
Mac OS X: Releases vrs. R12 to 2007.

Prior to the import process, additional Settings can be made, which will affect how the selected file will import. The following parameters can be applied to the import:

- **Group Entities** - Group entities by Layer Name or Geometry.
- **Hatches** - Check this box if you want MAPublisher to read your hatch patterns upon import.
- **White Lines and Fills** - Enabling the *Import as is* option will instruct MAPublisher to import the data true to the original colour settings contained in the file. Check the *Change white lines and fills to black* box to import black lines instead of the files native white lines. Check the *Create black background* option to incorporate a layer containing a black background to mimic the AutoCAD environment.

ESRI INTERCHANGE FILE (*.E00)

An archive of files that describes a complete ArcInfo coverage. This is either ASCII or compressed into a binary and is used to transfer files between different versions of ArcInfo. It is a commonly found format for freely distributed data such as that found at the GIS Data Depot *(http://www.geocomm.com).*

A single E00 file describes a complete ArcInfo coverage. The file itself is actually an archive of several smaller files, referred to as subfiles. Some of these subfiles have fixed names which do not vary from coverage to coverage, and

follow a predefined data format. The remainder of the subfiles contained within an E00 are the info files. These files may contain user-defined attributes, and have names which vary from coverage to coverage.

Supported Elements		Supported Geometry	
Typical File Extensions	*.e00	Aggregate	No
Automated Translation	Yes	Circles	No
User-Defined Attributes	Yes	Circular Arc	Yes
Coordinate System Support	Yes	Elliptical Arc	Yes
Spatial Index	Never	Ellipses	No
Schema Required	Yes	Polygon	Yes
Geometry Type Attribute	e00_type	Donut Polygon	Yes
		Point	Yes
		Line	Yes
		Text	Yes

There are essentially four types of geometry defined in E00 files, which will be reproduced as layers during import: Arcs (lines), Points, Polygons, and Text. Prior to the import process, an additional Setting can be made:

- **Tic points layer** - This option enables you to include an additional layer which will hold the registration points for the imported data. The default is to set to Yes.

ESRI ARCINFO GENERATE (*.GEN)

ESRI simple ASCII storage and interchange format. There are three different types of .gen files each with of its own syntax one for points, one for lines, and one for text geometries. This is the format exported by ArcInfo generate command. The gen files are use by ArcInfo to transfer coverages to other mapping systems.

Supported Elements		Supported Geometry	
Typical File Extensions	*.gen	Aggregate	No
Automated Translation	Yes	Circles	No
User-Defined Attributes	No	Circular Arc	No
Coordinate System Support	No	Elliptical Arc	No
Generic Colour Support	No	Ellipses	No
Spatial Index	Never	Polygon	No
Schema Required	Yes	Donut Polygon	No
Geometry Type Attribute	arcgen_geometry	Point	Yes
		Line	Yes
		Text	Yes

ESRI SHAPEFILE (*.SHP)

The ESRI Shapefile is a geospatial vector data format for geographic information systems software. It is developed and regulated by ESRI as a mostly open specification for data interoperability among ESRI and other software products. A Shapefile is a digital vector storage format for storing geometric location and associated attribute information. This format lacks the capacity to store topological information

A single logical Shapefile consists of three physical files, each with one of the following file name extensions:
*.shp : Geometric data
*.shx : Index to the geometric data
*.dbf : Attributes for the geometric data

These extensions are added to the base name of the Shapefile , creating separate physical files that must all reside in the same directory. You must select the *.shp file for import. Point, multipoint, polyline, and polygon geometric data can be stored in *.shp files. However, a single *.shp file can contain only one type of geometry. Each entity in a *.shp file has a corresponding entry in the *.shx index file and a corresponding row of attributes in the associated *.dbf file. The order of the entries in each of these files is synchronized. For example, the 3rd geometric entity in the *.shp file is pointed to by the 3rd entry in the *.shx index file and has the attributes held in the 3rd row of the *.dbf.

A single Shapefile may also consist of a number of additional files, with the following file name extensions:
*.sbn / *.sbx : Spatial index files for the geometric data. These two files are only generating by an ESRI product however they are not required by MAPublisher for import and will they be generated when exporting data to the Shapefile format..
*.prj : Spatial coordinate system information.

If a *.prj file exists in your Shapefile directory, holding the coordinate system information of the Shapefile , this will automatically be read by MAPublisher on import. If your Shapefile folder does not contain a .prj file you will be required to specify the coordinate system in order to fully utilize MAPublisher.

Supported Elements	
Typical File Extensions	*.shp (*.shx, *.dbf, *.prj)
Automated Translation	Yes
User-Defined Attributes	Yes
Coordinate System Support	Yes (if have *.prj)
Generic Colour Support	No
3D Support	Yes
Schema Required	Yes
Transaction Support	No
Geometry Type Attribute	SHAPE_GEOMETRY

Supported Geometry	
Aggregate	Yes
Circles	No
Circular Arc	No
Elliptical Arc	No
Ellipses	No
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	No

MAPINFO INTERCHANGE (*.MIF/*.MID)

MIF is a published ASCII storage format used by the MapInfo. It is used as a file format for map and database exporting/importing in MapInfo software products. The *MapInfo Reference Manual* describes the MIF format and all constants it uses for colour, style, symbol, and fill patterns. MapInfo Interchange Format Files are often called MIF or MIF/MID files.

A single logical MIF file consists of two physical files, having the following file name extensions:
*.mif : Geometric data
*.mid : Attributes for the geometric data

These extensions are added to the base name of the MIF file, creating separate physical files that must all reside in the same directory. You must select the *.mif file for import.

Each entity in a *.mif file has a row of attributes stored in an associated *.mid file. A single .mif file contains many different types of geometry however, the associated attribute in the *.mid file must have the same number and type of fields for each entity in the *.mif file. The order of the entries in the two files is synchronized. For example, the second geometric entity in the *.mif file has the attributes held in the second row of the *.mid file. The number and type of attributes associated with each entity is specified by the user. There must be at least one attribute field in the *.mid file.

Supported Elements		**Supported Geometry**	
Typical File Extensions	*.mif (*.mid)	Aggregate	Yes
Automated Translation	Yes	Circles	Yes
User-Defined Attributes	Yes	Circular Arc	Yes
Coordinate System Support	Yes	Elliptical Arc	Yes
Generic Colour Support	Yes	Ellipses	Yes
Spatial Index	Never	Polygon	Yes
Schema Required	Yes	Donut Polygon	Yes
Geometry Type Attribute	mif_type	Point	Yes
		Line	Yes
		Text	Yes

Prior to the import process, additional Settings can be made, which will affect how the selected file will import. The following parameters can be applied to the import:

- **Import as Visible Attributes** - Enable this option to view the pen and brush pattern values in the imported attribute table.

The MAPublisher MID/MIF importer supports the storage of point, line, polyline, arc, ellipse, rectangle, rounded rectangle, region (polygon), and text geometric data in .mif files. Each geometric entity present in a *.mif file has display properties such as pen and brush width, pattern, and colour. Supported MID MIF properties are as follows:

MAPublisher supports the import of line weights (0-7), colours (24 bit RGB), strokes (1-71). It also supports fonts (family, style, justification) for text. In order to use line patterns and fill patterns you must have opened or accessed the style library equivalents. Two library files have been created, *MIF_LineStyles.ai* and *MIF_AreaStyles.ai*, which provide support for many of the standard MapInfo pen styles (stroke patterns) and brush styles (fill patterns). These files can be found in the *Helpful Styles & Symbols* folder on your MAPublisher CD. Please refer to your Adobe Illustrator User Guide for details about how to add these libraries to your Adobe Illustrator Graphic Style panel.

MAPINFO TABLE (*.TAB)

TAB is a proprietary geospatial vector data format for geographic information systems software used by MapInfo mapping products. A minimum of two files are required for the tab format. The .DAT file which stores the attribute data and the .TAB ASCII file which is the link between all other files and holds information about the type of data file. The MapInfo TAB importer is closely patterned after the MapInfo MIF/MID reader and writer. This commonality makes it easy to support both MIF and MapInfo native formats in the same mapping file.

A single logical TAB file consists of a number of physical files, having the following file name extensions:

*.tab : The main file for a MapInfo table, it is associated with the appropriate dat, map, id and ind files.
*.dat : Tabular data for a table in MapInfo native format
*.id : An index to a MapInfo graphical objects (MAP) file.
*.map : Contains geographic information describing map objects
*.ind : An index to a MapInfo tabular (DAT) file

These extensions are added to the base name of the TAB file, creating separate physical files that must all reside in the same directory. You must select the *.tab file for import.

Supported Elements	
Typical File Extensions	*.tab (*.dat, *.id, *.map, *.ind)
Automated Translation	Yes
User-Defined Attributes	Yes
Coordinate System Support	Yes
Generic Colour Support	Yes
Spatial Index	Always
Schema Required	Yes
Geometry Type Attribute	mapinfo_type

Supported Geometry	
Aggregate	Yes
Circles	Yes
Circular Arc	Yes
Elliptical Arc	Yes
Ellipses	Yes
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	Yes

Prior to the import process, additional Settings can be made, which will affect how the selected file will import. The following parameters can be applied to the import:

- **Import as Visible Attributes** - Enable this option to view the pen and brush pattern values in the imported attribute table

The MAPublisher TAB importer supports the storage of point, line, polyline, arc, ellipse, rectangle, rounded rectangle, region (polygon), and text geometric data in .tab files. Each geometric entity present in a *.tab file has display properties such as pen and brush width, pattern, and colour. Supported TAB properties match those described for MID MIF files on the previous page.

MICROSTATION DESIGN (*.DGN)

DGN are the native files created for Bentley Systems Inc. MicroStation product. These files consist of a header, followed by a series of elements. The header contains global information including the transformation equation from design units to user coordinates, as well as the dimension of the elements in the file. Each element contains standard display information, such as its colour, level, class, and style, as well as a number of attributes specific to its element type. For example, a text element has fields for font, size, and the text string in addition to the standard display attributes.

Supported Elements	
Typical File Extensions	*.dgn
Automated Translation	Yes
User-Defined Attributes	Yes
Coordinate System Support	No
Generic Colour Support	Yes
Spatial Index	Never
Schema Required	Yes
Geometry Type Attribute	igds_type
3D Support	Yes

Supported Geometry	
Aggregate	No
Circles	Yes
Circular Arc	Yes
Elliptical Arc	Yes
Ellipses	Yes
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	Yes

Supported Versions
Windows: V7, V8. Mac OS X: V7,V8

Prior to the import process, additional Settings can be made, which will affect how the selected file will import. The following parameters can be applied to the import: *Note: versions V7 and V8 and supported for import*.

- **Group Elements** - Choose how you want to group the elements of the file on import. If you group the elements by level, it may result in a large number of output files. *By Level* is the default.
- **Coordinate Units** -Choose *Master, Sub,* or *UOR* as the coordinate units of the features. *Master* is the default.
- **White Lines and Fills** - Enabling the *Import as is* option will instruct MAPublisher to import the data true to the original colour settings contained in the file. Check the *Change white lines and fills to black box* to import black lines instead of the files native white lines. Check the *Create black background* option to incorporate a layer containing a black background to mimic the AutoCAD environment.
- **Other** - Check *Drop complex chains* if you want each component of a complex chain to be returned as its own feature, otherwise all elements of the complex chain will be merged into a single linear feature.

TIGER/LINE (*.RT1) (*.BW1)

Topologically Integrated Geographic Encoding and Referencing (TIGER). TIGER is the United States Census Bureau format for its digital database of geographic features. TIGER includes both land attributes such as roads, buildings, rivers, and lakes, as well as areas such as counties, ZIP codes, census tracts, and census blocks. Some of the geographic areas represented in TIGER are political areas, including counties, congressional districts, school districts, and ZIP codes. Others are statistical areas, including Metropolitan Statistical Areas (MSA), census tracts, census block groups, and census block. The database contains information about these features such as their location in latitude and longitude, the name, the type of feature, address ranges for most streets, the geographic relationship to other features, and other related information. More information on the TIGER/Line file format and data product can be found on the U.S. Census web page at: *http://www.census.gov/geo/www/tiger/*

This web site contains a detailed description of the current TIGER/Line format, with an explanation of field meaning for each feature type. A detailed description of the TIGER/Line 1998 format, with an explanation of field meaning for each feature type, is available at: *http://www.census.gov/geo/www/tiger/tiger98.pdf*

Supported Elements		**Supported Geometry**	
Typical File Extensions	*.rt1, *.bw1	Aggregate	No
Automated Translation	Yes	Circles	No
User-Defined Attributes	Yes	Circular Arc	No
Coordinate System Support	Yes	Elliptical Arc	No
Generic Colour Support	Yes	Ellipses	No
Spatial Index	Never	Polygon	Yes
Schema Required	Yes	Donut Polygon	Yes
Transaction Support	No	Point	Yes
Geometry Type Attribute	tiger_type	Line	Yes
		Text	No

Supported Versions
1992, 1995, 1997, 1998, 1999, 2000, 2002

USGS DIGITAL LINE GRAPH (*.DLG) (*.OPT)

DLG is a fixed field record that may or may not have end of line markers. The DLG file structure was designed to accommodate all categories of spatial data represented on a conventional line map. DLG is a published ASCII format developed by the United States Geological Survey (USGS) Federal Agency and is intended to assist in data exchange with the National Digital Cartographic Data Base (NDCDB).

The DLG reader supports all three distinct types of DLG data:
- Large-scale DLG data (1:24,000-scale)
- Intermediate-scale DLG (1:100,000-scale)
- Small-scale DLG data (1:2,000,000-scale)

The three scales of DLG data are physically formatted into files in one of these ways: standard, optional, and graphics formats. MAPublisher supports both the standard and the optional DLG distribution formats; however the graphics format is not supported. Most DLG data is distributed in the optional format. The DLG file structure was designed to accommodate all categories of spatial data represented on a conventional line map. Node, line, and area data types are present within the DLG format, along with linkages and attribute codes. Linkages are references to other features within the same DLG data set, used in a variety of contexts. DLG files do not explicitly store attribute values but use a feature coding approach in which unique feature codes are assigned to the different types of features stored within the data set. MAPublisher will look for the extension .dlg or .opt for the input DLG files.

Supported Elements		**Supported Geometry**	
Typical File Extensions	*.dlg, *.opt	Aggregate	No
Automated Translation	Yes	Circles	No
User-Defined Attributes	No	Circular Arc	No
Coordinate System Support	Yes	Elliptical Arc	No
Generic Colour Support	No	Ellipses	No
Spatial Index	Never	Polygon	Yes
Schema Required	No	Donut Polygon	Yes
Geometry Type Attribute	dlg_type	Point	Yes
		Line	Yes
		Text	No

USGS SDTS (*CATD.DDF)

SDTS is the USGS robust way of transferring Earth-referenced spatial data between dissimilar computer systems with the potential for no information loss. It is a transfer standard that embraces the philosophy of self-contained transfers, i.e. spatial data, attribute, georeferencing, data quality report, data dictionary, and other supporting metadata all included in the transfer. More info can be found at http://mcmcweb.er.usgs.gov/sdts/. Files in the SDTS format will have the extension *.ddf. More information on this format can be found at: *http://mcmcweb.er.usgs.gov/sdts/*

A group of *.ddf files is normally identified by the catalog file, or *CATD.DDF file, which relates the files of a single SDTS transfer, and binds together all the files with a common prefix. Always select the SDTS file which ends in CATD, i.e. HP01CATD.DDF.

Supported Elements		**Supported Geometry**	
Typical File Extensions	*.ddf	Aggregate	No
Automated Translation	Yes	Circles	No
User-Defined Attributes	No	Circular Arc	No
Coordinate System Support	Yes	Elliptical Arc	No
Generic Colour Support	No	Ellipses	No
Spatial Index	Yes	Polygon	Yes
Schema Required	N/A	Donut Polygon	Yes
Transaction Support	No	Point	Yes
Geometry Type Attribute	sdts_type	Line	Yes
		Text	No

KEYHOLE MARKUP LANGUAGE (*KML)

KML is an XML-based language for managing the display of three-dimensional geospatial data in the programs Google Earth, Google Maps, Google Mobile and WorldWind. The KML file specifies a set of features for display. Each feature always has a longitude and a latitude and can have other data, such as tilt, heading, and altitude. KML shares some of the same structural grammar as GML. KML files are very often distributed as KMZ files, which are zipped KML files with a .kmz extension.

Supported Elements		**Supported Geometry**	
Typical File Extensions	*.kml, *.kmz	Aggregate	Yes
Automated Translation	Yes	Circles	No
User-Defined Attributes	Yes	Circular Arc	No
Coordinate System Support	Yes	Elliptical Arc	No
Generic Colour Support	Yes	Ellipses	No
Spatial Index	Never	Polygon	Yes
Schema Required	No	Donut Polygon	Yes
3D Support	Yes	Point	Yes
		Line	Yes
		Text	No

Prior to the import process, additional Settings can be made, which will affect how the selected KML file will import. The following parameters can be applied to the import:

- **Allow Random Colour Mode** - Enabling this option will allow Adobe Illustrator to generate random colour settings for your data.
- **Expand Network Links** - Checking this box will enable the use of network linked KML files.

DELIMITED ASCII TEXT (*CSV, *TSV,*TXT)

An ASCII file containing a tabular data where delimiters separate the columns and rows. Common delimiters are commas, spaces, or tabs. Microsoft Excel and many other spreadsheet programs will export data in these formats.

Supported Elements		Supported Geometry	
Typical File Extensions	*.csv, *.tsv, *.txt	Aggregate	No
Automated Translation	Yes	Circles	No
User-Defined Attributes	Yes	Circular Arc	No
Coordinate System Support	No	Elliptical Arc	No
Generic Colour Support	No	Ellipses	No
Spatial Index	Never	Polygon	No
Schema Required	Yes	Donut Polygon	No
		Point	Yes
		Line	No
		Text	No

Prior to the import process, additional Settings can be made, which will affect how the selected file will import. The following parameters can be applied to the import:

- **Axis Column** - Specify which columns contain the x and y coordinates for the point data to be read in.
- **Coordinate Format** - Choose the formatting type of the data you wish to import *(e.g. Decimal Degrees, Delimited Degrees Minutes Seconds, Packed DMS)*
- **Use first line as header** - Allows the user to enable the first line of the text file to be used as column headings.

S57 FORMAT (*000)

S57format is intended for the exchange of digital hydrographic data between national hydrographic offices and for its distribution to manufacturers, mariners and other data users. It is used for the supply of ENC cells (Electronic Navigational Charts) to ECDIS (Electronic Chart Display and Information System).

The format is public, developed and maintained by the IHO (International Hydrographic Office) CHRIS working committee (Committee on Hydrographic Requirements for Information Systems). The objects spatial geometry can be of Point, Line or Area geometry, while object descriptions are categorized in object classes, organized in specific attributes schemas. For a full format description, please visit *http://www.iho.shom.fr/PUBLICATIONS/IHO_Download.htm#S-*57 (Appendix A in particular). An online object catalog is also available on *www.s-57.com*

An S57 base file has the extension *.000, while the update files have extensions like .001, .002 and so on. It can also be accompanied by other files:
*.000: main file
*.001: update file 1
*.002: update file 2
*.00n: update file n
files.TXT and files.JPG: ancillary text and picture files indicated in attribute definition

Update files contains only the changed (new/deleted/modified) objects and are only used as a complement of a .000 file. Only the *.000 file is required for the import into MAPublisher. The update files will be applied at conversion, when present. However, text and image files linked to attributes will be ignored.

Supported Elements		Supported Geometry	
Typical File Extensions	*.000 (*.001 *.002...)	Aggregate	No
Automated Translation	Yes	Circles	No
User-Defined Attributes	No	Circular Arc	No
Coordinate System Support	Yes	Elliptical Arc	No
Generic Colour Support	No	Ellipses	No
3D Support	Yes	Polygon	Yes
Schema Required	N/A	Donut Polygon	Yes
Transaction Support	No	Point	Yes
Geometry Type Attribute	s57_type	Line	Yes
		Text	No

NOTE: Most ENC producers (private and public) publish their .000 files in encrypted formats. Only non-encrypted files can be imported in MAPublisher (from NOAA or USACE for example).

GEOGRAPHIC MARKUP LANGUAGE - SIMPLE FEATURES (*.GML)

GML was designed as a geographic interface language for the Geo-Web. It is currently in draft as an ISO standard (ISO 19136). The goal of the format is to provide users with a set of abstract base objects that can be built into working real world datasets. It uses as XML base to store geometry and feature information that can easily be transported across the Internet.

The GML simple feature profile was created by the Open Geospatial Consortium as a restricted subset of the GML specification. It provides a reduced geometry and metadata profile that can be shared across many GIS tasks. This simple feature model can be used as a base to generate local application profiles for a specific work area. Since the GML models base abstract classes, these application profiles (schemas) are required for accessing and processing any GML datasets. Generally, GML data has a *.GML extension, and requires any application specific schema files (*.xsd).

For more information on GML, and the GML simple features profile, please visit the Open Geospatial Consortium web site: *www.opengeospatial.com*

Supported Elements		Supported Geometry	
Typical File Extensions	*.gml (*.xml) *.xsd	Aggregate	Yes
Automated Translation	Varies	Circles	No
User-Defined Attributes	Yes	Circular Arc	Yes
Coordinate System Support	Yes	Elliptical Arc	No
Generic Colour Support	No	Ellipses	No
3D Support	Yes	Polygon	Yes
Schema Required	Yes (*.xsd)	Donut Polygon	Yes
Transaction Support	No	Point	Yes
Geometry Type Attribute	xml_type	Line	Yes
		Text	No

MAPublisher Unicode Support

This section contains information regarding Unicode character encoding in MAPublisher. MAPublisher supports Unicode character encoding in MAP Views, MAP Attributes, MAP Stylesheets, and MAP Selection Filters. MAPublisher can also reference Adobe Illustrator layers, graphic styles and character styles using Unicode encoding.

To use Unicode character encoding you require a Unicode compliant font. Mac OS X users will have Unicode compliant fonts installed with OS X. Windows users will require Unicode compliant fonts to render Unicode. For more information on Unicode visit *http://www.unicode.org*

The following tables display Unicode—UTF8 support in MAPublisher, for GIS data formats that are Unicode—UTF8 compliant. Unicode support for importing and exporting data is different, so for each platform two tables have been created. For each data format there are four areas where Unicode character encoding can be used:

1. *File Directory* - when Unicode encoding is used in the path to where the file is located.
2. *Filename* - when Unicode encoding is used in the filename.
3. *Attribute column name* - when Unicode encoding is used in a column name for attributes.
4. *Attribute value* - when an attribute value contains Unicode encoding.

Windows Unicode Support (*Importing*)

Data Format	File Directory	Filename	Attribute Column Name	Attribute Value
Delimited Text	✓	✓	✓	✓
CAD-DWG	✓	✓	FORMAT HAS NO ATTRIBUTES	
CAD-DXF	✓	✓	FORMAT HAS NO ATTRIBUTES	
ESRI Inter-change File	✓	✓	✓	✓
ESRI ArcInfo Generate	✓	✓	FORMAT HAS NO ATTRIBUTES	
ESRI Shapefile	✓	✓	✓	✓
GML (Simple Features)	✓	✓	✓	✓
MapInfo MIF/MID	✓	✓	✗	✓
MapInfo TAB	✓	✓	✗	✓
MicroStation Design	✗	✗	FORMAT HAS NO ATTRIBUTES	
KML	✓	✓	✓	✓
S57	✓	✓	FORMAT USES SIMPLE ASCII TEXT FOR ATTRIBUTE NAMES AND MOST VALUES	

Windows Unicode Support (*Exporting*)

Data Format	File Directory	Filename	Attribute Column Name	Attribute Value
Delimited Text	✓	✓	✓	✓
CAD-DWG	✓	✓	FORMAT HAS NO ATTRIBUTES	
CAD-DXF	✓	✓	FORMAT HAS NO ATTRIBUTES	
ESRI Inter-change File	✓	✓	✓	✓
ESRI ArcInfo Generate	✓	✓	FORMAT HAS NO ATTRIBUTES	
ESRI Shapefile	✓	✓	✓	✓
GML (Simple Features)	✓	✓	✓	✓
MapInfo MIF/MID	✓	✓	✗	✓
MapInfo TAB	✓	✓	✗	✓
MicroStation Design	✗	✗	FORMAT HAS NO ATTRIBUTES	
KML	✓	✓	✓	✓

Mac OS X Unicode Support (*Importing*)				
Data Format	**File Directory**	**File-name**	**Attribute Column Name**	**Attribute Value**
Delimited Text	✓	✓	✓	✓
CAD-DWG	✓	✓	FORMAT HAS NO ATTRIBUTES	
CAD-DXF	✓	✓	FORMAT HAS NO ATTRIBUTES	
ESRI Inter-change File	✓	✓	✓	✓
ESRI ArcInfo Generate	✓	✓	FORMAT HAS NO ATTRIBUTES	
ESRI Shapefile	✓	✓	✓	✓
GML (Simple Features)	✓	✓	✓	✓
MapInfo MID/MIF	✓	✓	✗	✓
MapInfo TAB	✓	✓	✗	✓
MicroStation Design	✗	✗	FORMAT HAS NO ATTRIBUTES	
KML	✓	✓	✓	✓
S57	✓	✓	FORMAT USES SIMPLE ASCII TEXT FOR ATTRIBUTE NAMES AND MOST VALUES	

Mac OS X Unicode Support (*Exporting*)				
Data Format	**File Direc-tory**	**File-name**	**Attribute Column Name**	**Attribute Value**
Delimited Text	✓	✓	✓	✓
CAD-DWG	✓	✓	FORMAT HAS NO ATTRIBUTES	
CAD-DXF	✓	✓	FORMAT HAS NO ATTRIBUTES	
ESRI Inter-change File	✓	✓	✓	✓
ESRI ArcInfo Generate	FORMAT HAS NO ATTRIBUTES			
ESRI Shapefile	✓	✓	✓	✓
GML (Simple Features)	✓	✓	✓	✓
MapInfo MID/MIF	✓	✓	✗	✓
MapInfo TAB	✓	✓	✗	✓
MicroStation Design	✗	✗	FORMAT HAS NO ATTRIBUTES	
KML	✓	✓	✓	✓

Windows Unicode Support (*Working with Images*)				
Data Format	**File Directory** *(Register Image)*	**Filename** *(Register Image)*	**File Directory** *(Export Image)*	**Filename** *(Export Image)*
World File (.tfw)	✓* / ✓♦	✓* / ✓♦	✓* / ✗♦	✓* / ✗♦
Image Report (.irp)	✓* / ✓♦	✓* / ✓♦	✓* / ✗♦	✓* / ✗♦
MapInfo TAB (.tab)	✓* / ✓♦	✓* / ✓♦	✓* / ✗♦	✓* / ✗♦
ListGeo (.lgo)	✓* / ✓♦	✓* / ✓♦	✓* / ✗♦	✓* / ✗♦
GeoTIFF (.tif)	✓* / ✓♦	✓* / ✓♦	✓* / ✗♦	✓* / ✗♦

******When using system encoding on Windows XP*
(for example, using the default Japanese encoding on Japanese Windows XP)

♦*When using non-system encoding on Windows XP*
(for example, using Japanese encoding on English Windows XP)

Mac OS X Unicode Support (*Working with Images*)				
Data Format	**File Directory** *(Register Image)*	**Filename** *(Register Image)*	**File Directory** *(Export Image)*	**Filename** *(Export Image)*
World File (.tfw)	✓⊙	✓⊙	✓⊙	✓⊙
Image Report (.irp)	✓⊙	✓⊙	✓⊙	✓⊙
MapInfo TAB (.tab)	✓⊙	✓⊙	✓⊙	✓⊙
ListGeo (.lgo)	✓⊙	✓⊙	✓⊙	✓⊙
GeoTIFF (.tif)	✓⊙	✓⊙	✓⊙	✓⊙

⊙*Limited support*
(not all combinations of Unicode characters are supported)

Frequently Asked Questions

This section presents a number of frequently asked questions regarding the use of MAPublisher. If the answer to your question is not included here please consult the online FAQs at *http://www.avenza.com/products.faq.html* or the online MAPublisher Forum at *http://www.avenza.com/forum/* . In addition, there is a US Census Bureau GIS FAQ database at *http://www.census.gov/geo/www/tiger/faq-index.html*

INSTALLATION/ACTIVATION ISSUES

The MAPublisher plug-in is in the Plug-ins folder but the filters do not all show up in Adobe Illustrator.

Try exiting out of Adobe Illustrator, deleting the Adobe Illustrator preferences and plug-in cache files, and then restarting Adobe Illustrator. They are named *AIPrefs* (Windows) or *Adobe Illustrator Prefs* (Mac OS X) and *Plug-in Cache*. They are generally found in the directories:

Illustrator CS2 and CS3:
Windows XP: *Documents and Settings\[user name]\Application Data\Adobe\Adobe Illustrator CSXX Settings*
Windows Vista: *Users\[user name]\AppData\Roaming\Adobe\Adobe Illustrator CSXX Settings*
Mac OS X: *Users/[user name]/Library/Preferences/Adobe Illustrator CSXX Settings/*

Illustrator CS4:
Windows XP: *Documents and Settings\[user name]\Application Data\Adobe\Adobe Illustrator CS4 Settings\en_US*
Windows Vista: *Users\[user name]\AppData\Roaming\Adobe\Adobe Illustrator CS4 Settings\en_US*
Mac OS X: *Users/[user name]/Library/Preferences/Adobe Illustrator CS4 Settings/en_US/*

Also check under *Preferences > Plug-ins & Scratch Disks* and ensure that the correct location of your plug-ins folder is indicated.

I try to access the MAPublisher filters, but always receive a message saying MAPublisher cannot obtain a license. What should I do?

1. Check you have registered your copy of MAPublisher and received a license file. MAPublisher will fail to operate until you have received a license file for activation. For further details, please see chapter 1.
2. If you have purchased a machine-specific or fixed license you must ensure the License file is located in the following directory:
   Windows XP: *C:\Documents and Settings\All Users\Application Data\Avenza\MAPublisher 8*
   Windows Vista: *C:\ProgramData\Avenza\MAPublisher 8*
   Mac OS X*: Applications/Avenza/MAPublisher 8/MAPublisher Plug-In/*
3. If you have a try-out version of MAPublisher, check that your copy has not expired. To do this, locate the *.lic file in the directory listed above. Open this file in a simple text editor. On the second line will be details of the expiration date of your try-out version. Note that this file has been automatically generated by Avenza and therefore manually editing will not re-activate MAPublisher.
4. If you have moved your license to a new computer you must notify Avenza and request a rehosting. To organize a rehosting email activation@avenza.com and provide your MAPublisher 8 serial number along with the new machine ID. The new machine ID can be found by selecting the Telephone/Email option in the MAPublisher Activation Wizard on the new computer.

Can I run two different versions of MAPublisher at the same time?

You can run different full version releases (i.e.. 8.x and 7.x) if you have two versions of Adobe Illustrator. For example MAPublisher 8 using Adobe Illustrator CS3 and MAPublisher 7.6 using Adobe Illustrator CS2. You **cannot** run two point-releases of MAPublisher 8.x on the same machine even if you have two different versions of Adobe Illustrator.

How can I move my MAPublisher license to a new computer?

Unless you have purchased a floating license, MAPublisher is licensed for use on one machine only and includes a protection mechanism that prevents activation on more than one computer. If you wish to move your license permanently to a new computer please perform the following steps:

1. Completely remove MAPublisher from the existing computer.
2. Install MAPublisher on the new computer.
3. Launch Adobe Illustrator on the new computer and start the menu H*elp > MAPublisher Licensing > License Management*
4. Note the machine ID that will be displayed and email that 12-digit string along with your MAPublisher 8 serialnumber to activation@avenza.com and indicate that you wish to move the license to a new computer.

Why does the activation wizard repeatedly open when I have a valid license installed?

If the activation wizard repeatedly prompts you to activate MAPublisher but you have already have a valid licence file from a previous activation installed then you should follow the procedure below.

1. Exit Adobe Illustrator
2. Locate your Adobe Illustrator preferences file typically named
   AIprefs (Windows)
   Adobe Ilustrator Prefs (Mac)
3. Once the file is located, delete the file and restart Adobe Illustrator.
   This should resolve the problem.

NOTE: This applies to both floating and stand alone license users

MEMORY AND SPEED ISSUES

Why do I need so much more memory (RAM) than I do with my GIS?

The graphics software environment of Adobe Illustrator loads the entire file into memory rather than just reading it from disk, thus more memory is required. MAPublisher builds a mini-GIS application inside Adobe Illustrator so that it can geo-code information and attach data to objects. This also has some overhead. When you are importing a lot of files with MAPublisher into Adobe Illustrator, you'll notice that the amount of available memory will decrease rapidly and your computer loses speed. This is due to the memory management. MAPublisher reserves a fairly large amount of memory for each import-action, which is not always returned when the import is done. The solution is simple: save your file, close it and open it again. It's not even necessary to close Adobe Illustrator itself. By closing the file the reserved memory is properly returned.

How can I improve the speed of my data import?

Many GIS data files are large and when a series of such files is imported, you may find that the import filter starts to run more slowly. This is because scratch and memory allocations are being used up. Try the following suggestions:

- Close the MAP Attributes panel prior to importing data.
- Periodically save your work then close and reopen the file. This will free up the available scratch memory.
- Reduce the maximum number of undoes, since they all reside in memory.
- See the Memory Considerations section for other suggestions, pages A1/25 and A1/26.

DATA IMPORT ISSUES

Why do my files appear squashed after import?

They are probably stored in geographic or lat/long coordinates. Data in lat/long usually looks "squashed". You can project them into an alternate map projection using the **MAP View Editor** (see chapter 4).

What alternatives are there for importing a file format not supported by MAPublisher?

We provide a web page that has links to freeware, shareware and commercial GIS data translators at *http://www.avenza.com/support.links.html*. If you cannot find the translator that you need give us a call as we may have other suggestions.

I am having trouble getting my layers to overlay correctly. Both files import correctly when they are imported alone, but when I import the second file, they do not line up as expected.

They should overlay correctly. Probably they are in different coordinate systems. It is very important that you ensure that data used within a single mapped area have the same map projection. If different data sets for a geographic location have differing coordinate systems, the chances are high that they will not overlay on import. If the files are of differing coordinate systems, any software will give you the same results. If the coordinate systems are known, you can use the MAP View Editor filter to change all data to a common coordinate system. For more information about map projections see *http://www.gisdevelopment.net/tutorials/tuman007pf.htm*.

Why do my MapInfo files crash on import or do not import properly?

There are a couple of possible common causes of this. A couple of possibilities may be:

1. How did you transfer the file to the machine where it is being imported?
   If you have transferred these files from one operating system to another then you must always use ASCII FTP transfer, or the files may be corrupted. We have found that you can not rely on the automatic transfer with all ftp utilities. Some do not recognize the .MID files as being text. The .mid files may be inadvertently interpreted as binary music files, which often carry the same file extension. If they are transferred as binary you will have trouble importing them.
2. Were the files compressed?
   If the files are compressed using a Windows ZIP format, you must be careful when decompressing them. If this is the case and the utility you used was Stuffit, you need to make sure that it was set for a DOS zip file or the file can be corrupted. The shareware utility ZIPIT found at *http://maczipit.com* has been found to be quite good for decompressing Windows zip files.

I am having trouble with importing SDTS files. Where am I going wrong?

Be very careful how you receive a xxx.tar.gz file off the USGS web site and decompress it. These files are in a binary format and if you use Smart TAR CR/LF translation it will not import and may cause errors in MAPublisher. Make sure that you do all FTP transfers as binary. After you receive it, use gzip to decompress it and TAR to further decompress it. You should have about 20 separate files, look for the ones that end in xxxxCATD.DDF.

Why does my data sometimes vanish?

If you imported some data and it appeared when selected, but when you deselected the data it seemed to vanish, here are a few things to check:

- You may have inadvertently pressed cut or the delete key. Check under Edit in the menu bar, if the *Undo Clear* task is available this means that you just deleted something. Select *Undo Clear*, and the data should return.
- Check the order of your layers. Try moving the layer in question to the top of the list of layers in the Layers panel so that it is drawn on top of the other layers.
- Make sure that current layer is available for viewing in the Layers panel, by having a dot in the left-hand column under the eye (visualization) and beside the layer name.
- Check that you have colours for the fill and stroke set in the paint panel.
- Check the setting for the stroke width and increase if necessary.

Why are my Shapefile s not imported?

There are a couple of possible causes of this. The two items to check for are:

1. Make sure that you have all three required files. There should be a triplet for each layer/coverage with the extensions *.dbf, *.shp and *.shx. If you are missing any of these files, you will not be able to import your files successfully.
2. If you have transferred these files from one operating system to another, you must always use binary ftp transfer, or the files may be corrupted. We have found that you cannot rely on the automatic transfer with all ftp utilities. Some do not recognize the files as being binary and will transfer them as ASCII.

EXPORTING ISSUES

How do I strip all the attributes from a MAPublisher file?

Simply drag your MAP Layers into the default MAP View entitled *[Non-MAP layers]*, and all georeferencing and attribute information will be removed. Note that this function must only be used as a final step.

What causes missing features when exporting MAPublisher layers?

If you are using an pre-existing Adobe Illustrator file not created with MAPublisher you must correctly assign MAPublisher status to your layers and data. Only one feature type per layer is supported. The feature type icon next to your MAP Layer in the MAP Views panel is indicative of the features on that layer, and is the feature type which will be applied if the layer is exported. For example if you have Point symbols on a Line layer, they will not be recognized as being MAPublisher objects and will be dropped in the export process.

Why is MAPublisher exporting the Area values as negatives?

When exporting Area layers to GIS formats, polygon outlines must have a positive *Area* value, whereas holes held inside compound paths (or complex shapes) must have a negative *Area* value. If you have values for polygons in the #Area property column of your MAP Attribute table which contradict these guidelines, you can use the following tools to convert the MAPublisher area calculation from a negative to a positive value or vice versa:

- **Flip Lines** tool (see chapter 8) for converting multiple areas.
- Create a **Selection Filte**r (see chapter 11) to select all elements that have an #Area of less than zero (to select negative values) or greater than zero (to select positive values). Then go to *Filter* > *Flip Lines*.
- **#AreaDirection** property value (see chapter 5) for converting areas at a time. Select the area to edit and then choose the alternate value for #AreaDirection in the **MAP Attributes** panel.

LABELLING ISSUES

I am having trouble with the MAP Tagger tool? Where am I going wrong?

This can happen either when the layer or object to be labelled is not available for editing. Check to make sure that the desired layer is available for editing, the features in question are not locked, and you have a Text layer in your document to use to output the text to. In addition, if there is no fill to an area or polygon object the label tool (much like the Adobe Illustrator selection tool) can only find the paths defining the unfilled area. Therefore in such cases it cannot find the unfilled area and thus cannot label the unfilled area.

PROJECTION ISSUES

How do I know what coordinate system my files are in?

In MAPublisher, the importers will automatically determine the coordinate system of the chosen files, if this information is included in the file header or is located in an associated file (e.g. *.prj). If MAPublisher returns a message of *<No Coordinate System Specified>* for the Projection, you should first ask your data provider to provide you with this information. Also there are a couple of strong hints that may indicate that a file is in lat/long. Both ArcView and MapInfo tend to store files in lat/long for rapid reprojection. This is why most files derived from such sources are stored in lat/long. A good test to see if a file is in lat/long is to look at the Map Anchor values in the MAP View Editor or in the MAP Location Tool. Typical Lat/Long values will be X between -180 and 180 and Y between -90 and 90.

OTHER ISSUES

How accurate is MAPublisher georeferencing?

At this point in time we are restricted to 32 bit storage for numbers, which allows for seven digits of precision. The 32 bit storage restriction is controlled by the graphics environment software and not the MAPublisher software. We have asked for this storage restriction to be increased to 64 bit without success. We can and do all our internal calculations in 64 bit for accuracy, but the results still must be stored as 32 bit. MAPublisher values are roughly 4.3 billion times more precise than Adobe Illustrator.

Adobe Illustrator is fundamentally an art program. The numbers used for its vertex data are more than sufficient to provide precision enough such that the human eye cannot tell the difference, even at its highest zoom level. Unfortunately, MAPublisher must translate its coordinates into Adobe Illustrator when placing them on the artboard. We do this using mathematical calculations based upon the parameters you provide (e.g. map and page anchors, scale, etc.). When MAPublisher does this, it is, in a sense, compressing its more-precise numbers into Adobe Illustrator less-precise numbers, and this is where the truncation may occur.
An easier way to visualize this is to think of a pad of grid paper. If this paper was the artboard, Adobe Illustrator would only be able to place points where two grid lines meet, but MAPublisher could put points anywhere on the page. However, since Adobe Illustrator is ultimately where the information is plotted, when a MAPublisher point is plotted on the page it would get rounded to the nearest grid line intersection point.

I am receiving an "Error loading plug-ins" when I start Adobe Illustrator. What should I do?

Search for and delete any copies of a file named *Adobefnt05.lst*. If that does not work, search for and delete any copies of a file whose name starts with *Adobefnt* and has a **.lst* extension. The Adobefnt *.lst files are cached descriptions of the font environment. They can be rebuilt when needed so it is safe to delete them.

Why do some art objects fail to display completely?

Sometimes drawing with Adobe Illustrator shape creation tools results in the object not being displayed completely by Adobe Illustrator. The object's geometry is complete because if you set the View to outline *(View > Outline)* as opposed to *Preview* you can see that the object is there in its entirety (you can also zoom in and out). However, once you restore the zoom level to the original extents at which the object was created, it will no longer appear as a complete shape. The solution to this is to disable the anti-aliasing option in the Adobe Illustrator preferences dialog box.

Are there any sources for free GIS data?

There are a multitude of web sites which offer free GIS data in several different forms. Please see pages A1/27 to A1/29 of this user guide for a list of several free download sites.

What can cause attribute corruption?

The most likely cause of attribute corruption (other than the files being corrupted before you got them) is that you have put layers with differing attribute structures into a single layer. As a rule of thumb you should use one layer for each external file that you are importing.

Also, some Adobe Illustrator functions cause the link between artwork objects and their attributes table to be broken, and therefore attribute information gets lost. These functions are:

- Compound path (Make).
- Pathfinder.
- Live Paint.
- Blob brush (Adobe Illustrator CS4).

If required, users should first duplicate their working layer in the Adobe Illustrator Layers panel before using these functions.

What can I do when a filter does not appear to work?

- Make sure that you have highlighted the desired Layer in the Layers panel and that it is unlocked and visible.
- Make sure that what you have asked the filter to do makes sense.
- Try closing Adobe Illustrator and deleting your Adobe Illustrator preferences file.

GIS Backgrounder

WHAT IS GIS?

A **Geographic Information System** (GIS) captures, stores, checks, analyzes, and displays georeferenced data about the Earth. A GIS uses a database management system (DBMS) to store and link data that relates to the same geographic area. This facilitates the following types of queries:

- What if…?
- What is it?
- Where is it?
- What spatial patterns exist?
- What has changed since…?

FEATURES OF A GIS

Analytical Tool

GIS systems are used by all levels of governments, academia and business for such diverse purposes as monitoring environmental changes, sales planning, census reporting, municipal zoning, land records, mineral resource management, and mapping telecommunications and cable television utilities. In short, a GIS serves many needs and can be thought of as an analytical tool since it can be used to determine spatial relationships between geographic areas. A GIS contains a database linking spatial data with geographic information and lets you associate information with map features and to create new relationships based on those associations.

Areas

An area is a closed, bounded object, which encompasses a homogeneous area (e.g., a park).

Attributes

Attributes store descriptive information and are stored as sets of characters (including numbers). Attributes are usually considered tabular data.

Geographic Data

Since a GIS is a digital map database storing both spatial (graphic) and descriptive (tabular) information, the integration of this information provides an opportunity for analysis and communication. Data is stored using the Cartesian system (X,Y coordinates) as follows:

- Points are stored as a single X,Y location
- Lines are stored as a series of ordered X,Y coordinates
- Areas are stored as a string of X,Y coordinates defining the lines that bound the area.

Labels, Symbols and Colour

Map attributes can be represented by labels, symbols, and colour to make them easy to interpret (e.g. rivers may be represented with blue lines of varying widths depending upon their size).

Layers

Map features can be logically grouped into layers of related information. For example, a map could be layered by rivers, soils, mineral deposits, and municipality. This layering makes it easy to perform analysis that overlay geographic features and combine adjacent areas with similar characteristics.

Lines

A line represents the linear shape of a map element, which is too narrow to be an area (e.g., a contour line or road).

Map Features

A GIS stores two types of map information: spatial information (which describes the location and shape of geographic features) and descriptive information about those features. A GIS links these two types of data and maintains the spatial relationships between the map features. Features are portrayed on two-dimensional maps as points, lines, and areas. For example, a map may contain points representing location information (such as telephone poles), lines representing linear features (such as roads), and areas representing geographic features (such as lakes).

Points

Usually represented by a symbol or label, a point is a discrete location which is usually too small to be identified as an area or line (e.g. an oil wellhead or manhole).

Spatial Relationships

A map allows you to identify spatial relationships (e.g., a fire tower located inside a park) but it relies on you to derive this information from it.

Topology

Topology is a mathematical process for determining spatial relationships. It does this by expressing different spatial relationships as lists of features (i.e. an area is defined by the boundary lines). The primary advantage of this type of data storage is that it is more efficient and permits faster processing of larger data sets.

Graphics Backgrounder

WHY IS THE GRAPHICS ENVIRONMENT GOOD FOR MAPPING?

Avenza supports the fact that performing map-related graphics tasks is best done in the right environment-a powerful graphics program like Adobe Illustrator. This environment offers practicality, freedom and easy maneuverability for fast, cost-efficient and professional graphic output results. The MAPublisher environment focuses on the map graphics first with the right GIS data management tools to facilitate the map production process in the easiest and most efficient way. This is in direct contrast to traditional GIS software that are designed and written, for the analysis of geographic data, with the graphic map production coming second, almost as an afterthought. This means that as powerful as most GIS are for analysis, they were never designed for cartographic or publication quality mapping. Cartographers have long been doing their mapping within graphics environments because they provide tools such as Bezier curves and true CMYK colour separation for publication quality mapping.

FEATURES OF THE GRAPHIC ENVIRONMENT

Accurate Colour

Colours displayed on screen accurately reflect the colours as they will be printed.

Proportional Symbology

Symbology is accurately proportional to the map area you have zoomed into.

Views

You can display your document on–screen in a variety of ways using the View menu commands. For example, you can see a preview of the illustration as you edit, you can view only the outlines of your artwork, or you can preview selected parts of your artwork while displaying the rest as outlines. You can also create and save custom views of your document, retaining a particular magnification level, layering, and other viewing features for later retrieval. You can even display multiple views of a document at several different magnification levels simultaneously.

Redrawing is Automatic

Redrawing of the affected map objects is clean and automatic and impacts only the redrawn portion and possibly some immediately adjacent portions of the map. This eliminates the need to wait while the entire map is re-drawn or refreshed. This applies to text as well as to vector data.

Broad Selection of Fonts

A broad and flexible selection of text fonts, styles, sizes and enhancement features (e.g. Haloing) is available.

Paste in Front or Behind

When pasting map objects/elements, you have the option of deciding to paste the new object "in front" or "behind" the copied elements at the time of pasting.

Postscript Pattern Fills

You can use PostScript pattern fills and complex vector strokes. You can sample colours from images and apply them precisely to vector data.

Complex Colour Treatments

Even with complex colours you can quickly and accurately create colour ramps with differing depths/intensity of 10%, 20%, etc. These can be set as individual colours on a panel or as a gradient across mapped features.

Improved Symbology

Improved symbology (e.g. road treatments and cartographic symbols) than is available in traditional GIS software.

Speed Drawing

You can easily turn on and off selected layers of a map to speed drawing. This can be done by turning off specified layers, and/or limiting the display of selected layers to simple vectors with all symbology removed. Not only will this speed the handling of the map, it lets you easily use underlying vectors for reference with no distraction or distortion caused by mapping symbology.

Actual Size Viewing

In addition to standard zooming and panning capabilities, you can view the details on a map at the actual size at which they will be plotted/printed.

Rulers, Guides and Alignment Tools

Rulers with adjustable guides and multi-combination alignment tools are available for use in aligning map objects.

Grouping and Ungrouping

There is grouping and ungrouping functionality. When items are grouped you still retain the option of separately accessing, querying and otherwise working with the individual components of a map group.

Store Related Objects

Individual but related map objects can be stored together by groups or by layers or both within the graphic file. This provides additional control and support in handling and organizing the map components.

Text Placement

The graphics environment offers a truly hands-on text placement environment and goes well beyond that of a GIS. For example text can be easily placed along any path or outside the map extents and is fully editable.

Memory Considerations

RAM RECOMMENDATIONS

Occasional User: 1 GB of RAM is recommended.
A graphics or GIS user who uses MAPublisher with medium sized data sets with up to 20 layers, minimal text labels, and some low-resolution or small coverage raster images.

Power User: 2 GB or more of RAM is recommended.
A professional cartographer who uses MAPublisher daily and works with large urban data sets (including large transportation layers) with 20 or more layers, raster based air photographs, large numbers of text labels, complex fill patterns, etc.

RAM USAGE HINTS

Users often ask us why is so much RAM needed to operate MAPublisher. First of all, Adobe Illustrator requires a significant amount of RAM itself in order to run smoothly. Secondly, map data sets are often large which increases the need for RAM even further. Map data sets contain both vector and attribute data which must be stored in memory. Since we are adding a database to Adobe Illustrator this increases the file size, which increases the RAM requirements. MAPublisher builds a mini-GIS application inside Adobe Illustrator so that it can geo-code information and attach data to objects. This also has some overhead.

GIS users also often ask why so much more memory is needed with MAPublisher than is with GIS software. The graphics environment software of Adobe Illustrator loads the entire file into memory rather than just reading it from disk, thus more RAM memory is required.

When you are importing a large number of files into Adobe Illustrator using MAPublisher, you'll notice that the amount of available memory will decrease rapidly and your computer loses speed. This is due to the memory management. MAPublisher reserves a fairly large amount of memory for each import-action, which is not properly returned when the import is done or even when it is cancelled. The solution is simple: save your file, close it and open it again. It's not even necessary to close Adobe Illustrator itself. By closing the file, the reserved memory is properly returned.

RAM SAVING TIPS

Since a percentage of the memory is taken for attribute storage, drop any redundant or otherwise unnecessary attribute fields from the map attributes table.

Many sources of street data include paths/vectors that are segmented based on street addressing information. You can use the MAPublisher Join Lines filter to join these into single linear features based on a selected attribute field. Reducing the number of objects (and data records) in the map file will free up memory.

Many GIS data files are large and when a series of such files is imported, you may find that the import filter starts to run more slowly. This is because scratch and memory allocations are being used up. The best solution is to periodically save your work, quit out of Adobe Illustrator and then restart. This will free up the available scratch memory.

The minimum number of undoes can be reduced (since they ALL reside in memory).

Use polylined or pre-joined linear feature data sets where available.

In your GIS application strip out the attributes you won't be using for queries or labelling before importing the data into Adobe Illustrator.

You can set a primary and secondary scratch disk under the Adobe Illustrator preferences option in order to draw additional storage from a partitioned or multi-drive environment.

Turn off the layer preview icon that appears to the left of each layer name in the Adobe Illustrator layers panel. This can be done by clicking the options menu in the layers panel and then selecting small panel rows in the panel option dialog box.

Online Links

Since the Internet is always changing, refer to our web page (www.avenza.com) for the most recent list of relevant Internet sites or do a Google or Yahoo search. As of the writing of this manual all the following links were active and functional.

For Geographic Information System (GIS) users, the appeal of graphics is strong and the increasing ability to discover and share GIS across the Internet is fascinating. The Internet offers a large number of free-access GIS-related web sites from which you can access map and information data sets.

For the general public, there's general information about countries, states, and places; simple maps of areas (e.g., GIF, PS format); lists and maps of Internet resources in an area.

For cartographers and geography researchers, there are cartographic/ GIS base map files (e.g., USGS Demos, DLGs, TIGER); thematic data of a geographic nature (e.g., census data); and complete GIS data sets (e.g., ESRI Interchange Files).

These lists are readily available, and there is a comprehensive list of free data sites accessible from the MAPublisher Internet home page at: *http://www.avenza.com/support.links.html*.

FREE MAP DATA

The following are just some of the many sites on the Internet that offer free download of GIS data. Data is available from these and other Internet sites in a wide variety of formats. Please consult the sections in this manual on file formats (chapter 2 and A1/2 to A1/12) to ensure that you obtain usable data.

AUSLING data

Australian national mapping agency offering digital map data, satellite imagery and elevation data. Data obtained here can be used for commercial purposes with permission.
• *http://www.ga.gov.au/*

CAST data

The Center for Advanced Spatial Technologies (CAST), University of Arkansas. Planned free access on the ARKNet statewide network. Among its high–tech offerings, CAST maintains a catalog of Arkansas, U.S. national and global data - e.g. GIS data in areas of archaeology, agriculture and population are downloadable as GIF files across the Internet. Obtain a map of historical land coverage data. Obtain data sets including Environment, Prehistoric and Historic Climate Reconstruction, Historic Census, and Tabular databases.
• *http://libinfo.uark.edu/gis/us.asp*

Directions Magazine Data Center

Directions magazine is an internet-centred publication that provides news, analysis, commentary product information and free map data.
• *http://www.directionsmag.com/files*

EROS Data Center

The Eros Data Center will be providing FTP access to a variety of USGS digital data sets.
• *http://edcwww.cr.usgs.gov*

Geocommunity and GIS Data Depot

The GeoCommunity and GIS Data Depot are an excellent sources of free GIS data, geographic software (including data viewers, translators and compression utilities) and industry news. This site also has several GIS-related discussion forums. The data found on this site covers most areas of the world.
• *http://www.geocomm.com*

Geoconnections/Geoconnexions

This site from Canada Ministry of Natural Resources offers many links to GIS data and other informational resources.
• *http://www.cgdi.gc.ca*

Geography Network

The Geography Network is an online resource for finding and sharing world-wide geographic content, including maps and data from many of the world's leading providers.
• *http://www.geographynetwork.com*

Geogratis

Geogratis is a Natural Resources Canada site offering maps, satellite imagery and tabular data.
• *http://geogratis.cgdi.gc.ca*

GISuser

GISuser.com was launched in February, 2004. Their goal is to provide the geospatial technology user with the latest news, resources, and tools affecting the GIS industry.
• *http://www.gisuser.com*

National Atlas of the United States

This site is a great source of a wide variety of data files for the United States.
• *http://www.nationalatlas.gov/atlasftp.html*

NOAA ENC Download

NOAA distributes its Electronic Navigational Charts in S57 format, free of charge, on this site.
http://www.nauticalcharts.noaa.gov/mcd/enc/download_agreement.htm

Doug Price's list of Free Digital GIS Data

This site based at the Tennessee Geographic Information Council and the University of Tennessee offers an extensive list of data download links from around the world.
• *http://www.lib.utk.edu/~tngic/price.html*

Robert E. Kennedy Library @ California Polytechnic State University

California Polytechnic State University has various links to US-based map inventories.
• *http://lib.calpoly.edu/collections/gis/webresources.html*

United State Geological Survey

Department of the Interior – USGS home page. This is the primary source for Digital Line Graph (DLG) files. A must–have resource is the US Geological Survey Digital Format Standards manual published by the USGS.
- *http://www.usgs.gov* - USGS Home page.
- *http://www.usgs.gov/ngpo/* - National Geospatial Program.
- *http://www.usgs.gov/pubprod/index.html* - Products and Publications Listings.
- *http://greenwood.cr.usgs.gov* - The USGS Greenwood map server.

United States Fish and Wildlife Service

The FWS carries a variety of map data in the USGS DLG format.
- *http://www.fws.gov*

USACE IENC download

The US Army Corps of Engineer distributes inland ENC files in S-57 format. They can be freely downloaded on the web site *http://www.tec.army.mil/echarts/inlandnav/main.html#download*

OTHER VALUABLE MAPPING LINKS

The following are some additional places on the Internet where you can find news, reviews, tips and general GIS, cartographic and geographic information.

GIS Cafe:
- *http://www.giscafe.com*

GIS Dictionary
- *http://www.geo.ed.ac.uk/agidict/welcome.html*

GIS Lounge
- *http://www.gislounge.com*

GIS@Development
- *http://www.gisdevelopment.net*

University of Edinburgh
- *http://www.geo.ed.ac.uk/home/gishome.html*

University of Florida - Geoplan Center
- *http://www.geoplan.ufl.edu*

US Census Bureau
- *http://www.census.gov*

Technical Support Options

MAPublisher support is provided free of charge to customers with a current MAPublisher Maintenance Program (MMP) subscription. All new license and upgrade purchases include a one year MMP subscription. Customers without a current MMP subscription may obtain support from a qualified MAPublisher technical specialist at the rate of US$49 per incident.

TECHNICAL SUPPORT

Please consult the FAQs on pages A1/15 to A1/20, the additional how-to's on the following pages as well as the following online options before contacting Avenza technical support as your situation may be easily addressed by one of the answers contained therein.

MAPublisher User Forum

The MAPublisher User Forum is located at *http://www.avenza.com/forum*. Answers to common technical questions may be found in the **Common Support Issues and FAQs** category. All users with a MAPublisher license (evaluation or permanent) can post and read topics under the **General Questions for Evaluation and Licensed Users** category. Additionally, users with maintenance have access to the **Maintenance Users** category. There, users can find additional information relative to software updates, etc.

Internet Mailing Lists

There are two very popular Internet mailing lists that are populated by experienced MAPublisher users worldwide and offer an open forum for discussing problems, solutions, tips and other general issues relating to MAPublisher and cartography. These lists are also monitored by Avenza technical support staff who often participate with a solution or useful discussion item.

- **mapublisher-l** - This is the main MAPublisher list. Subscribe by sending an email to *majordomo@avenza.com* with the statement *subscribe mapublisher-l <emailaddress>* in the body of the message. Substitute your actual email address for *<emailaddress>*.
- **map-mac** - This is a very popular mapping list to which many MAPublisher users belong. It is not limited to mac-related discussions. Subscribe by sending an email to *majordomo@avenza.com* with the statement *subscribe map-mac <emailaddress>* in the body of the message. Substitute your actual email address for *<emailaddress>*

Contacting Avenza Technical Support

Avenza offers a number of methods for direct communication with our qualified and experienced technical experts. Please have your MAPublisher registration details handy to get prompt attention and include it in any email correspondence. Support issues are handled on a first come, first-served basis. Avenza does not guarantee a response within any specified time. MAPublisher Maintenance Program subscribers receive free and unlimited support. All others are eligible for support at the rate of US$49 per incident.

- **email:** *support@avenza.com*
- **online form:** *http://www.avenza.com/support.form.html*
- **phone:** +1.416.487.6442

MAPUBLISHER MAINTENANCE PROGRAM (MMP)

The MAPublisher Maintenance Program is a subscription-based service plan that guarantees its members:

- unlimited priority technical support - guaranteed same business day (9-4 EST) or next business day response
- unlimited telephone support (+1-416-487-6442)
- free MAPublisher updates
- free MAPublisher version upgrades
- additional discounts and offers available to MMP members only

Your MAPublisher purchase includes a one-year membership in the MAPublisher Maintenance Program so you are well on the way to worry-free use of MAPublisher for the first year and will be able to enjoy all the benefits of the MMP immediately. All MAPublisher Maintenance Program subscriptions begin on the date of purchase and run for one calendar year.

Your email address has been automatically entered in the **maintenance-l** online email list for MMP subscribers so that you are assured of receiving all the latest MMP news and access to all the update and upgrade files. If you purchased your MAPublisher license from a reseller or are the end user but not the person who purchased the software, please contact us at *sales@avenza.com* to ensure that we receive your email address and add you to the MMP notification group.

Renewal

Approximately 6-8 weeks prior to the expiration of your annual MMP subscription you will be notified regarding renewal options. You will be contacted a minimum of five times prior to expiration in order to ensure that you have ample opportunity to renew or not at your discretion. You will have the option of renewing your MMP for an additional year at the then prevailing price or canceling without penalty. Of course, if you cancel or let your MMP lapse you will no longer be entitled to the benefits of the program as outlined above and will thus have to purchase future upgrades at the upgrade price.

There is a grace period of approximately 30 days from the time of the MMP expiry during which you may still renew without penalty. All post-expiration renewals will be backdated to the actual expiry date.

Lapsed Subscriptions

Failure to renew your MMP within 30 days from the expiry date will result in a lapsed MMP subscription. Lapsed subscriptions may not be renewed and the licensee will be required to purchase support and upgrades accordingly.

Please direct all MMP questions and purchase inquiries to *info@avenza.com*.

WISHLIST

As either a new or experienced MAPublisher user we value your opinions on how we can improve our product. Please let us know what functions you would like to see incorporated into future upgrades of MAPublisher.

- email us at *support@avenza.com*

General Tips and Hints

CREATING ASCII DELIMITED POINT FILES

There may be times when you wish to add a point or a series of points to your map but you do not have a GIS or ASCII file containing these points ready for import. Provided you have the real-world coordinates for the locations you wish to plot *, you can manually create a delimited ASCII file using a text editor (ex. Notepad, BBEdit, SimpleText, Ultra Edit etc.) or a spreadsheet program (ex. Excel, Lotus 123 etc.). This file can then be imported using either Simple or Advanced Import using the ASCII Point Data import format.

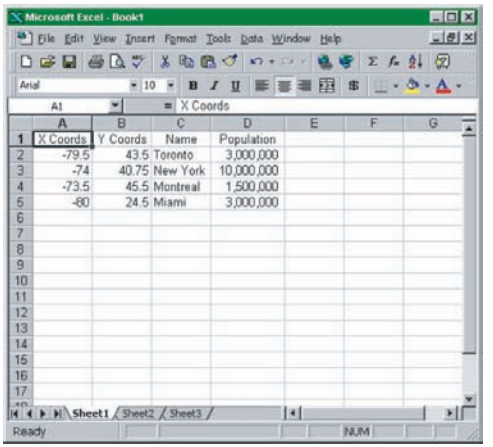
One column in the file must contain the X coordinates of the points and another must contain the Y coordinates. You can add as many additional columns as you wish containing additional information to be imported as attribute data.

If you are using a text editor, you can simply type in your data in the following format:

"Column 1 Header","Column 2 Header","Column 3 Header"...etc
"Column 1 Value 1","Column 2 Value 1","Column 3 Value 1"...etc
"Column 1 Value 2","Column 2 Value 2","Column 3 Value 2"...etc

Note that negative values for the X and Y coordinates denote west longitudes and south latitudes, respectively. Also make sure to enter a carriage return using the *enter* key on your keyboard after the last line of data otherwise the last line may be ignored by the MAPublisher Point Importer.

If you are using a spreadsheet application you can enter your point information as a table and save the file in a text format, preferably .csv or .txt, choosing either comma or tab delimiting. The spreadsheet application will format the text automatically. The screenshot below illustrates an example of such a table in Microsoft Excel prior to exporting as a .csv or .txt for import into Adobe Illustrator using MAPublisher.



** The MAP Location Tool can be used to generate the X and Y coordinate values suitable for building ASCII Point Files. See chapter 4 for more information.*

JOINING SDTS TABLES

The following information should be used in conjunction with the MAPublisher Join a Table function.

When working with United States Geological Survey SDTS files it is necessary to join tables frequently in order to obtain the map attribute table you require to make the map you want. This is due to the fact that SDTS data is constructed such that the primary vector data is held separately from the various attribute tables that one might want to use for a particular mapping purpose. The attribute table that comes as part of the vector file usually contains a unique identifier (RCID) for each map element that is used to join it with the other data tables. For example, a particular vector file containing the geography of rivers would contain a data column called RCID. Various data tables containing information such as vegetation, fish counts or flow rates might be available each also with an RCID column. The desired tables are then joined to the initial map attribute table by RCID value using the techniques described in the previous pages.

To find the SDTS tables to join with the vector map file look for the files which have names that start with the same character string as the name of the vector file. MAPublisher imports SDTS files that have the characters "CATD" at the end of the file name. A typical table to import and join with this file might be called HY01CATD.ddf.

Use the MAPublisher table importer with SDTS file type chosen to import these files. When you join layer and table, you do the join based on the column from the layer matched to the RCID column of the table. Several SDTS sample files can be found on your MAPublisher CD in the SDTS_samples folder. Note that the CATD catalog file found amongst the SDTS files explains what each table is.

ROTATING OBJECTS INDIVIDUALLY IN ADOBE ILLUSTRATOR

On some occasions you may wish to rotate selected objects about their own centres rather than as a group about a common origin. This can be accomplished using the native Adobe Illustrator **Transform Each** function. To use this function, first select the objects you wish to rotate. Then go to *Object* > *Transform* > *Transform Each*. In the *Rotate* box enter a desired rotation value and click OK. Each of the selected objects will be rotated individually about their own centres.

You may also use the #Rotation property column to individually rotate point symbols or text items based on a specified value. See chapter 5 for guidelines on how to use this function.

GEOREFERENCING AN ADOBE ILLUSTRATOR FILE

If you are using an existing Adobe Illustrator file that was created without the use of MAPublisher and as such does not contain any geographic parameters or attribute data, the following steps will enable you to georeference your Adobe Illustrator file and ultimately create an attribute-rich and accurate scale and world grid structure for your map. Please note that the steps that follow refer to functions that are outlined in more detail in the body of this user guide. Please familiarize yourself with the main MAPublisher functions and in particular those under the MAP Views section (see chapter 4) before proceeding.

Before beginning to georeference an Adobe Illustrator file you must be in possession of the following information:

1. The real-world scale of your data
2. Details of the coordinate system the data is in (i.e. Projection, Datum etc)
3. The X-Y coordinates of one tie-in point in the coordinate system of your data

When you have this information please use the following guidelines in order to georeferencing data with MAPublisher in Adobe Illustrator.

1. Go to *View* > *Show Rulers*. Set the 0,0 point to the lower left hand corner of the page by double-clicking the cross hairs in the upper right corner.
2. If you have a completed Adobe Illustrator vector file go to step 3. Otherwise, place and digitize your raster image. Identify a registration or tie-in point in your document. This should be a specific location in your document for which a real-world coordinate location is known or can be easily determined. Record the location of this point in real world coordinates on a piece of paper.
3. Locate the same tie-in point on the Adobe Illustrator document page and determine its X,Y coordinates in page units. Record this number as well using *Window* > *Info*.
4. You should now have the location of your tie-in point in both map and page units (e.g. –79.5, 43.5 in Lat/Long is located at 4cm, 2cm in the document).
5. Open the *MAP Views* panel, navigate to the *Options* section and select *New MAP View*.
6. Enter a name for the MAP View. Set the *Scale* to the proper scale of the map (i.e. a set distance in document units divided by a set distance in ground units).
7. Click the *Specify* button. Choose a projection which matches that of your vector data and click OK.
8. Click *OK* in the MAP View Editor to apply the information to the new MAP View.
9. In the *MAP Views* panel, navigate to the *Options* pullout, and then click *Specify Anchors*.
10. Set the *Map Anchors* to the value of the tie-in location in map units using the values determined in step 3 (e.g. –79.5, 43.5).
11. Set the *Page Anchors* to the value of the tie-in location in Page Units using the values determined in step 4 (e.g. 4, 2). Then click OK.
12. If you have not previously done so, ensure that each layer in your Adobe Illustrator file contains only one feature type (*Point, Area, Line*, *Text, Legend*).
13. In the *MAP Views* panel drag each of the layers which contain your data in to your new MAP View, ensuring that you set the appropriate Feature Type in the *Define Layer* dialog box.
14. Repeat steps 1-13 for any other coordinate systems which exist in your document (such as inset maps for example).
15. Your document is now a georeferenced MAPublisher file wherein each feature is also georeferenced and capable of accepting attributes using the MAP Attributes function (see chapter 5). You can also use the MAPublisher *Export* function to create a GIS file from this newly georeferenced Adobe Illustrator map.

TIPS ON EXPORTING TO OTHER GIS SOFTWARE WITH MAPUBLISHER

These strategies do not focus on how to do the procedures, as these are discussed in the Export section (page 63), but more on what you need to know and understand for successful export results.

First and most importantly you need to understand that the MAPublisher export was designed to export MP imported or created data one layer and one feature at a time. Why is it important to know this? MAPublisher only recognizes objects that have been imported by or created with its filters. If a layer was not imported with MAPublisher or is not hosted by a designated MAP View, then MAPublisher will not allow you to export the layer.

If you have an entire layer that was not created by MAPublisher then:
1. Ensure that your layer contains only a single feature type (*Point, Area, Line* or *Text*).
2. In the *MAP Views* panel, check that you have a designated MAP View with a matching coordinate system. If you do not, create a new MAP View (see page 59).
3. Select the layer in the MAP Views panel.
4. Drag the layer to the MAP View containing the matching coordinate system to georeference the layer.

There are also a couple of additional considerations to be aware of when exporting:

Since the current exported vector formats are GIS formats that do not support the concept of Bezier curves you need to compensate for this. If you have Bezier curves in your Adobe Illustrator file they will not be recognized in the GIS software. In order for these features may be represented correctly you will need to add points to these lines in Adobe Illustrator first. Simply identify and select any objects that use Bezier curves and then select *Object* > *Path* > *Add Anchor Points*. Repeat this command until the line has a sufficient number of anchor points that the shape of your curves will not be lost on export.

Adobe Illustrator stores the origin of text that has been applied along paths differently from other text objects. We have found the following steps to be the most successful way to get such Text exported to GIS files:
1. Create a new Adobe Illustrator layer
2. Select any text that has been created along paths.
3. Drag this text to the new Adobe Illustrator layer
4. Select *Type* > *Create Outlines*. The text will be converted to vector objects.
5. In the *MAP Views* panel, drag this layer back into your MAP View, specifying Area as the feature type

You can now export your Text as Area objects. Since the text is no longer text, you can no longer modify the fonts. We recommend that you make a copy of the original text objects before you do this process. These hints on how to transfer Adobe Illustrator files are necessary because the graphics environment handles text and curves differently and they need some modification in order for the GIS software to represent these accurately.

TIPS ON EXPORTING DATA TABLES

You can export any data tables that are linked to physical features in MAPublisher.
1. To export as a comma-delimited data table, export the desired features as MapInfo mid/mif format. The export file with the extension .mid will contain your attribute data in comma delimited form.
2. To export as a DBF data table, export the desired features as ArcView shape files format. The export file with the extension .dbf will contain your attribute data in standard DBF format.

DOUGLAS-PEUCKER LINE SIMPLIFICATION

The Douglas-Peucker algorithm was primarily designed to reduce the number of points required to represent a vector line. A common problem in digital cartography and geographic information systems can occur when lines are generated automatically from a mathematical function, which records points at a fixed interval regardless if they are all lying along a straight line. A reduction of the number of points makes for a cleaner and more readable cartographic line. As well in cartographic work within Adobe Illustrator the removal of points along a path can significantly improve the speed of file redraws and reduce the overall file size.

The Douglas-Peucker Algorithm was created in Fortran 66 by David H. Douglas and Thomas K. Peucker at the University of Ottawa in 1970-71. It was extensively tested in 1972 and was publicly communicated in the following article: *Algorithms for the Reduction of the Number of Points Required to Represent a Digitized Line or Its Caricature*, Canadian Cartographer, Vol. 10, No. 2, December 1973.

There are a number of online resources where more information may be found on the Douglas-Peucker algorithm including *http://everything2.com/index.pl?node_id=859282* and *http://facstaff.unca.edu/mcmcclur/GoogleMaps/EncodePolyline/algorithm.html*.

BEZIER CURVES AND OTHER MAPUBLISHER OPERATIONS

Bezier curves are defined using four control points. Two of these are the end points of the curve, while the other two effectively define the gradient at the end points. These two points control the shape of the curve. The curve is actually a blend of the control points. This is a recurring theme of approximation curves; defining a curve as a blend of the values of several control points.

Most GIS formats do not usually support Bezier curves used in graphics packages such as Adobe Illustrator. As such you will typically find that curved sections of GIS data will be composed of a series of small line segments rather than an actual curve. This is also how such features will first appear in Adobe Illustrator when imported with MAPublisher. The Adobe Illustrator *Object* > *Path* > *Simplify* filter can be used to convert this type of feature into a Bezier curve (see chapter 8).

If Bezier curves are exported from Adobe Illustrator using any of the MAPublisher Export filters they will be converted to link and node topology (i.e. the end points of the curve will simply be joined as straight lines). It is therefore necessary to create additional points to curves to retain their true shape. This can be done globally by using the Adobe Illustrator **Add Anchor Points** function via *Object* > *Path* > *Add Anchor Points*.

This version of MAPublisher supports Bezier curve features during the following operations:

- Scale and Projection transformations via the MAP View Editor
- Area and length calculations

CREATING SYMBOLS FOR USE IN POINT STYLESHEETS

A MAPublisher Symbol Library and a National Parks Symbol Library are supplied in the *Helpful Styles & Symbols* folder on the MAPublisher CD. You may also find that a search on the internet may be useful for finding additional libraries. If you are required to create new symbols, the steps below will help you to quickly create symbols manually in Adobe Illustrator.

1. Use Adobe Illustrator **Tools** for the manual creation of artwork that will comprise the new symbol. If you wish to use a character that are contained in a font library, select the text character instance and click the menu *Type > Create Outlines* to convert the text to vector art.
2. Open the Adobe Illustrator **Symbols** panel *(Window > Symbols*).
3. Select the artwork that will comprise the new symbol and drag it into the Adobe Illustrator **Symbols** panel double-click the symbol in this panel to assign a name.
4. When **MAP Stylesheet Editor** is accessed for Point Stylesheets, this symbol will be available in the **Style** column.

CREATING A STYLESHEET TEMPLATE

You can create template files with legends to automate the production of a series of similar maps.

1. The procedure when using MAP Stylesheets is as follows:
2. Create a prototype map using the MAPublisher **Stylesheet** function to create the desired "look".
3. Make a copy of your prototype map file. Delete all the layers from the file so that only the designated stylesheets exist
4. Save it to a new template file.
5. Use this template file as a base for future maps as follows:
   a) Make a copy of the template file.
   b) Import all map layers into the template file and do any needed processing.
   c) In the MAP Stylesheets panel, drag your MAP Layers into the desired MAP Stylesheets.
   d) Your new layers will be symbolized by the previously defined Stylesheet.

CREATING A MULTI-CONDITION IF EXPRESSION

In Edit Expression it is possible to assign symbology to map objects by assigning an expression to the #Style column. In the following example this is achieved by creating a multi-condition IF statement.

In the following example, a point layer represents cities. Each point has the value "Y", "N" or "C" in the CAPITAL attribute column, describing whether the city is a state capital (Y), is not a state capital (N) or is a country capital (C). There are three point symbols to assign to the type of point. In this example the following expression can be assigned to the #Style column of the point layer.

IF(CAPITAL = "Y", "MAP Symbol 01", IF(CAPITAL = "C", "MAP Symbol 02", "MAP Symbol 03"))

Therefore: If the capital is "Y", assign the symbol "MAP Symbol 01". If the capital is "C" assign the symbol "MAP Symbol 02". All other symbols assign "MAP Symbol 03".

NOTES FOR EXPORTING IMAGES

If the document colour mode is CMYK, exporting an embedded image may result in increased file size compared to RGB mode.

If the image is LINKED consider the following:

1. The image will be exported in the original colour mode of the image irrespective of the current colour mode of the document (i.e. a linked grayscale image in a CMYK document will be exported as a grayscale image, whereas a linked RGB image in an CMYK document will be exported as a RGB image).
2. A linked image with Alpha channels may be exported in a different colour model. For example a grayscale with two alphas will export as an RGB or an RGB with an alpha channel will export as CMYK.
3. Linked images in CMYK mode (regardless of the color mode of the document) will export with an incorrect result and should therefore be avoided (see chapter 12).

If the image is EMBEDDED consider the following:

1. The image will be exported in the colour mode of document (i.e. an embedded grayscale image in a CMYK document will be exported as a CMYK image, whereas an embedded CMYK image in an RGB document will be exported as an RGB image).
2. Embedded grayscales do NOT pick up the document colour model (i.e. an embedded grayscale image will be exported as grayscale).
3. The export of embedded Bitmap images is not supported.

KEYBOARD SHORTCUTS

This version of MAPublisher supports the use of keyboard shortcuts in order to increase the efficiency of the user and to make it easier to access commonly used dialog boxes and menus. By default the Simple and Advanced Import dialog boxes can be accessed by pressing Shift+Ctrl+I and Alt+Shift+Ctrl+A, respectively. All other MAPublisher tools can have keyboard shortcuts manually set by accessing the Adobe Illustrator Keyboard Shortcut dialog box which is located under *Edit > Keyboard Shortcuts*.

Appendix 2: All About Coordinate Systems

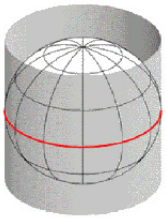
Overview

PROJECTIONS OVERVIEW

Map Projections are attempts to show the surface of the Earth, or parts of it, on a flat surface. Some distortions of conformality, distance, direction, scale, and area always result from this process. Certain projections minimize distortions in some of these aspects at the expense of maximizing errors in others, whereas others only moderately distort all of these properties.

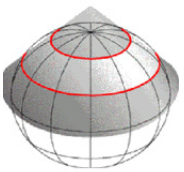
- **Conformality**: The scale at any point on the map is the same in all directions. Meridians (lines of longitude) and parallels (lines of latitude) intersect at right angles. Projections with these properties are **Conformal.**
- **Distance**: A map has an **Equidistant** projection when it portrays equal distances from the centre of the projection to any other place on the map.
- **Direction**: A map preserves direction when azimuths (angles from a point on a line to another point) are portrayed correctly in all directions. Projections with these properties are **Azimuthal**.
- **Scale**: The relationship between a distance portrayed on a map and the same distance on the Earth.
- **Area**: When a map portrays areas over the entire map so that all mapped areas have the same proportional relationship to the areas of the world they represent, the projection used is an **Equal Area** projection.

PROJECTION CATEGORIES

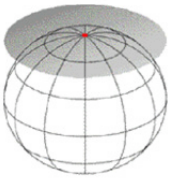


Cylindrical Projection: The result of projecting a spherical surface onto a cylinder. In a typical cylindrical projection, one imagines the paper to be wrapped as a cylinder around the globe, tangent to it along the equator. Light comes from a point source at the centre of the globe or, in some cases, from a filament running from pole to pole along the globe's axis. In the former case the poles clearly cannot be shown on the map, as they would be projected along the axis of the cylinder out to infinity. In the latter case the poles become lines forming the top and bottom edges of the map. The Mercator projection, long popular but now less so, is a cylindrical projection of the latter type that can be constructed only mathematically. In all cylindrical projections the meridians of longitude, which on the globe converge at the poles, are parallel to one another; in the Mercator projection the parallels of latitude, which on the globe are equal distances apart, are drawn with increasing separation as their distance from the equator increases in order to preserve shapes. However, the price paid for preserving shapes is that areas are exaggerated with increasing distance from the equator. The effect is most pronounced near the poles; E.g., Greenland is shown with enormously exaggerated size although its shape in small sections is preserved. The poles themselves cannot be shown on the Mercator projection.

Conic Projection: The result of projecting a spherical surface onto a cone. In a conic projection a paper cone is placed on a globe like a hat, tangent to it at some parallel, and a point source of light at the centre of the globe projects the surface features onto the cone. The cone is then cut along a convenient meridian and unfolded into a flat surface in the shape of a circle with a sector missing. All parallels are arcs of circles with a pole (the apex of the original cone) as their common centre, and meridians appear as straight lines converging toward this same point. Some conic projections are conformal (shape preserving); some are equal-area (size preserving). A polyconic projection uses various cones tangent to the globe at different parallels. Parallels on the map are arcs of circles but are not concentric.



Azimuthal Projection: The result of projecting a spherical surface onto a plane. In an azimuthal projection a flat sheet of paper is tangent to the globe at one point. The point light source may be located at the globe's centre (gnomonic projection), on the globe's surface directly opposite the tangent point (stereographic projection), or at some other point along the line defined by the tangent point and the center of the globe, e.g., at a point infinitely distant (orthographic projection). In all azimuthal projections, the tangent point is the central point of a circular map; all great circles passing through the central point are straight lines, and all directions from the central point are accurate. If the central point is a pole, then the meridians (great circles) radiate from that point and parallels are shown as concentric circles. The gnomonic projection has the useful property that all great circles (not just those that pass through the central point) appear as straight lines; conversely, all straight lines drawn on it are great circles. A navigator taking the shortest route between two points (always part of a great circle) can plot his course on a gnomonic projection by simply drawing a straight line between the two points.



Miscellaneous Projections: Projections that do not fall into the above categories, such as unprojected maps, and rectangular latitude and longitude grids. Also this classification can be applied to modified projections, being altered versions of other projections. Pseudo projections have some of the characteristics of another class of projection. For example the Sinusoidal is called a pseudo-cylindrical projection because all lines of latitude are straight and parallel, and all meridians are equally spaced. However it is not a truly cylindrical projection because all meridians except the central meridian are curved.

DATUMS AND ELLIPSOIDS OVERVIEW

An ellipsoid is a mathematical figure generated by the revolution of an ellipse about one of its axes. The Earth is not a sphere but an ellipsoid distorted by rotation about its axis, with the globe bulging at the equator and flattened at the poles. The actual amount of the flattening is approximately 21.5 km difference between the polar and equatorial radii. Ellipsoidal Earth models are required for accurate range and bearing calculations over long distances. For example GPS navigation receivers use ellipsoidal Earth models to compute position and waypoint information. Ellipsoidal models define an ellipsoid with an equatorial radius and a polar radius. The best of these models can represent the shape of the Earth over the smoothed, averaged sea-surface to within about 100 metres.

Reference Ellipsoids are usually defined by semi-major (equatorial radius) and flattening (the relationship between equatorial and polar radii). Other reference ellipsoid parameters such as semi-minor (polar radius) and eccentricity can be computed form these terms.

A datum is a mathematical model that describes the shape of the ellipsoid, and orientation of coordinate systems used to map the Earth. A datum is a smoothed mathematical surface of the Earth's mean, sea level surface. Different nations and agencies use different datums as the basis for coordinate systems in GIS.

Modern datums range from flat-Earth models used for plane surveying to complex models used for international applications which completely describe the size, shape, orientation, gravity field, and angular velocity of the Earth.

DATUM EXAMPLES

- **NAD27**: For many years the North American Datum of 1927 was the standard in the United States. NAD27 was based on the Clarke Ellipsoid of 1866, which was developed from ground survey in Europe and North America in the 19th Century. The centre point for NAD27 is Meades Ranch in Kansas, USA.
- **NAD83**: During the 1970's and 1980's satellites were able to measure the ellipsoid flattening more accurately (the World Geodetic System ellipsoid of 1984 or WGS84) and a new datum was developed from these measurements called the North American Datum of 1983. The Global Positioning System is based on WGS84. The centre point for NAD83 is the centre of the Earth's mass and uses the GRS80 spheroid which factors in the Earth's equatorial bulge.

Coordinate Systems Considerations

In the MAPublisher application, the coordinate system option must be entered at two levels: coordinate system of the source data (when importing GIS data) and coordinate system of the final map.

SOURCE DATA COORDINATE SYSTEM

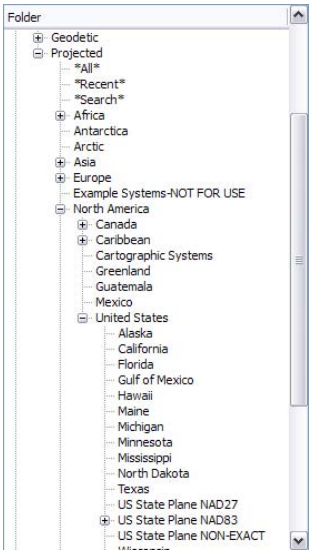
The Source coordinate system is usually detected when the coordinate system information is available with the GIS data being imported and when supported in the native GIS format (such as Shapefile , e00). However, in some cases, this information is not imported because it is not supported in the original GIS format (e.g. DWG, DXF...) or when using a non-referenced Adobe Illustrator files. In that case, the coordinate system must be specified by the user. It generally can be found from an attached metadata document, by contacting the data provider or in textual information on the original data itself (e.g. title of a scanned map).

In all cases, the **source coordinate system must be known with certainty**. Then only can the proper parameter be specified in the MAPublisher interface. A wrongly specified source coordinate system would make the map data unusable for transformations and merging with other datasets.

FINAL MAP COORDINATE SYSTEM

Most of cartographic projects are restricted in the choice of coordinate system for the final map. This parameter is usually part of the project requirement. It is the task of the professional cartographer to analyze carefully the situation to make the wise decision. For general purpose mapping projects (interpretive or marketing maps for example), a more approximative selection of the coordinate systems might be acceptable. Following the request from some of our users, who may not have a cartographic expertise, here are a list of simple considerations to take into account before making a choice:

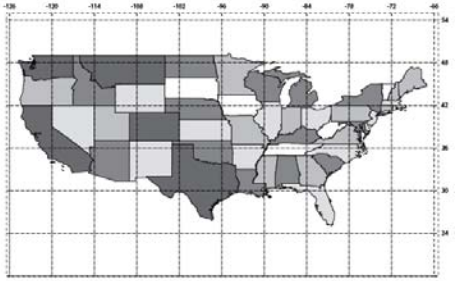
- Use of a Geodetic Coordinate system (angular coordinates, Lat/Long):
  - Appropriate for overlay with GPS data recorded in Lat/Long format.
  - WGS84 system is required to export vector data to KML format (for display in Google Earth, Google Maps).
- Use of a Projected coordinate system:
  - Appropriate for printed map (so that users can use a ruler to measure distances on the map).
  - Required to add a scale bar.
- Use of a particular system (within the list of projected and geodetic systems):
  - Maps that are part of a portfolio or Atlas have to comply to the same system to be consistent.
  - When a geo-referenced image (geotiff or world tiff) is to be used together with the data, it is easier to use the same coordinate system for the vector data as of the raster.
  - Most countries or geographic areas have published standards or usual way for representing the land (e.g. for road maps or meteorological maps). In this case, the user should make some test with the systems listed in MAPublisher. For a convenient use, geodetic systems are sorted by continent>country>sub-division (state or county for example).



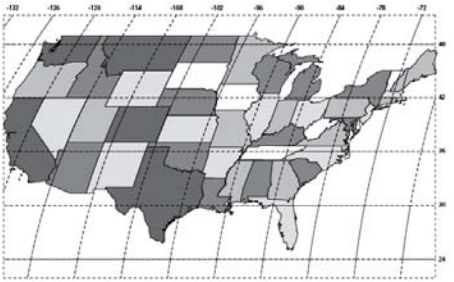
In doubt, it is recommended to test different coordinate systems and visualize the results.

Examples of appearance of the USA depending of the chosen coordinate system

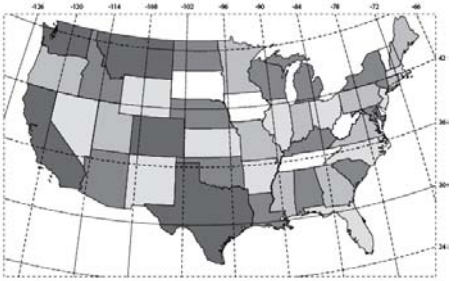
Geodetic > *World* > *WGS84* (unprojected)



Projected > *World* > *Robinson*



Projected > *North America* > *United States* > *US National Atlas*



The Geodetic Datasource

MAPublisher currently contains over 3500 coordinate systems which are defined by a wide range of differing projections, datums and ellipsoids. Even though the current list of selections is comprehensive there may be instances where the end users may wish to add a brand new coordinate system to meet their particular needs, or perhaps to duplicate and modify an existing definition to change the units for example. The default parameters installed with MAPublisher are stored within an XML database file referred to as the Geodetic Datasource, a file named **geodata.xml**.

MAPublisher ships with this base datasource file that is read only. It is stored in the following location:
Windows XP: *C:\Program Files\Avenza\MAPublisher 8\Data Source Files\geodata.xml*
Windows Vista: *C:\Program Files\Avenza\MAPublisher 8\Data Source Files\geodata.xml*
Mac OS X: *Applications/Avenza/MAPublisher 8/MAPublisher Plug-In/Data Source Files /geodata.xml*

MAPublisher allows users to create a custom definition where parameters are stored within a separate XML database file. Please ensure that where the custom xml is saved there is a copy of the geocalc.xsd in the same folder, as this will be needed to load the file (if not geocalc.xsd can be copied from Data Source Files folder).

NOTES:

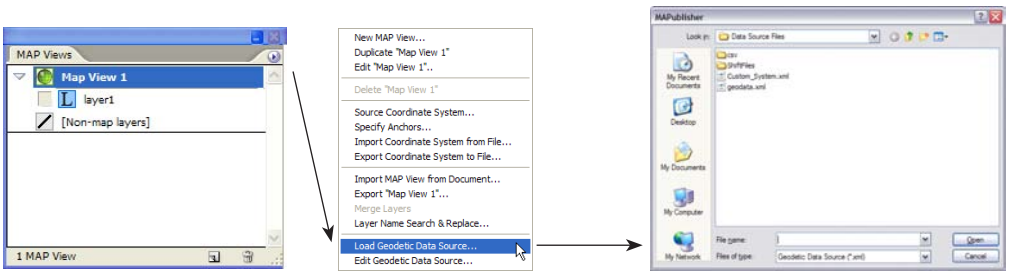
- Only predefined systems are maintained after a new installation of the software. Custom systems will have to be re-loaded manually.
- Files saved in the Data Source Files folder will be removed when MAPublisher is uninstalled.

LOADING A GEODETIC DATASOURCE

A geodetic datasource or coordinate system database can be loaded into MAPublisher, thus greatly extending the coordinate systems available for use. You can load a geodetic database within MAPublisher by choosing **Load Geodetic Datasource…** from the **MAP Views** panel options menu.

The directory containing the xml file must also contain the file **geocalc.xsd**. This file can be found in the directory of the default geodata.xml file (see above). So the custom xml file can either be copied to the Data Source File directory prior to loading, or geocalc.xsd should be copied from there to the custom xml directory.

Any additional change will be saved into the loaded xml file.



Selecting a geodetic datasource to load

NOTE: Coordinate systems may also be extracted from the input data formats (during import process).

GEODETIC DATASOURCE EDITOR

MAPublisher includes an extensive geodetic parameter database. The contents of the Geodetic Datasource can be browsed or searched by using a search frame. Users can extend MAPublisher Geodetic Datasource to support an unlimited number of custom linear and angular units, ellipsoids, datums, datum shifts, and coordinate systems.

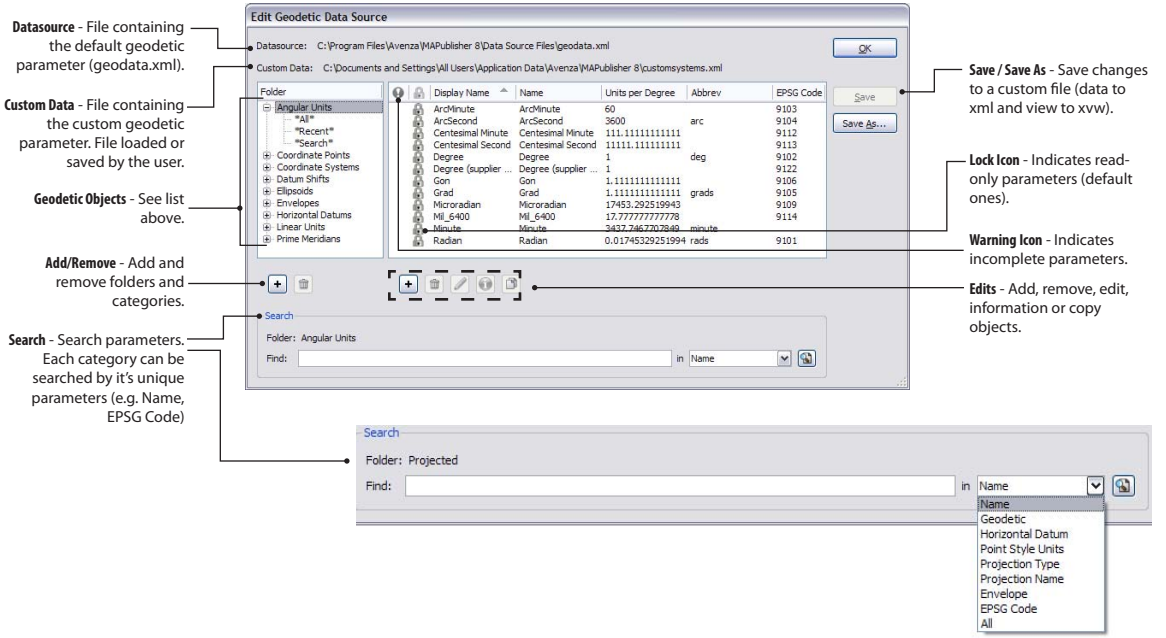
MAPublisher Geodetic Datasource Editor is accessed from the **MAP Views** panel options menu **Edit Geodetic Datasource file.**

NOTE: Coordinate systems may also be edited/created from the *Specify Destination Coordinate System* dialog box (started from **Specify** button in **MAP Views** panel and import dialog boxes), but the other geodetic objects are only accessible through *Edit Geodetic Datasource*.

Individual entries in the Geodetic Datasource are known as *Objects*. There are different types of objects for different types of definition. Objects contained in the Geodetic Datasource are:

- **Angular Units** - Type of units for measuring rotation (*e.g. degrees or radians*)
- **Coordinate Points** (Point Style)- A coordinate point is used to define the orientation of axes used and the type of units used in the system.
- **Coordinate Systems** (Coordinate Reference Systems) - A coordinate system is a complete definition needed to express the context of a set of map data (see page A2/14).
- **Datum Shifts** - Parameters to transform coordinates from one Datum to another.
- **Ellipsoids** - An Ellipsoid gives a horizontal datum its size and shape. An ellipsoid does not have an origin and cannot be used as a base model for coordinates on its own.
- **Envelopes** - Defines a geographic area of use for a particular object.
- **Horizontal Datums** - A horizontal datum, more commonly referred to as just datum is the base model maps are built on. All coordinate systems must have a datum associated with them to be related to any other map. Without a known datum, coordinates are meaningless.
- **Linear Units** - Units for measuring straight line, cartesian distances.
- **Prime Meridians** - The prime meridian represents the line of longitude that is designated as 0 degrees. All other lines of longitude are expressed by the angle by which they deviate from the prime meridian. Together with the equator of an ellipsoid, the prime meridian defines the origin of a geodetic coordinate system. A prime meridian is defined by the angle that separates it from the Greenwich meridian.

Users have the possibility to define new coordinate systems, make copy and modify existing objects. The custom objects are stored in a separate xml file saved by the user. Users can also re-organize the Geodetic Datasource (default and custom parameters) into categories and sub-folders. These changes are saved to a view file (.xvw). The view file may be deleted to reset the Geodetic Datasource Editor to its default state.



At the top of the **Edit Geodetic Datasource** dialog box two paths will be listed, the path to the main Geodetic Datasource file which is protected from user modification, and the *Custom* parameter file, where all of the user-defined definitions are stored.

On the left hand side of the dialog box, objects are organized into *Categories* tree. To explore the sub-categories of a category, click the plus sign (Windows) or arrow (Macintosh) to the left to see categories listed underneath. To see the entries at any particular level of category, click the category itself. With a category selected, the pane to the right will list the individual objects within the category.

New categories can be created by clicking the **New Category** button . A new category will be created titled New Category. Within each category you can create subcategories. Only user-defined categories can be deleted using the **Delete Category** button .

User objects can be organized via dragging and dropping within the dialog box. Like other databases the columns are re-sizable, and when column headings are clicked will sort information alphabetically/numerically.

The default objects (in black) are installed with MAPublisher. They are read-only and indicated with a lock icon. Custom objects are indicated in blue, they can be edited and deleted. Incomplete objects are indicated in red with an exclamation mark (warning icon). Particularly, some of the default datum shifts are pointing to external grid files (.gsb) that are missing. These files cannot be distributed by Avenza due to copyright or government regulations and have be acquired separately. To find the required file, refer to the value column in the Definition tab of the Datum Shift Viewer. For example, the file nb7783v2.gsb from the datum shift "NAD83 (CSRS) (1) Canada - New Brunswick" is

provided by Natural Resources Canada can provide the grid NTv2 (*http://www.geod.nrcan.gc.ca/tools-outils/ntv2_e.php*).

The **Search** entry box enables you to search for geodetic datasource by specifying a text string. The search may be further refined by searching only specific categories found in the adjacent drop-down list.

When using the **Save** button, changes are saved in the custom parameter file (and when no custom file has previously been loaded to **customsystems.xml**, located in the following directory):
Windows XP: *C:\Documents and Settings\All Users\Application Data\Avenza\MAPublisher 8*
Windows Vista: *C:\ProgramData\Avenza\MAPublisher 8*
Mac OS *Applications/Avenza/MAPublisher 8/MAPublisher Plug-In/Data Source Files*

And the default xvw file saved is **customview.xvw**, located in the following directory:
Windows XP: *C:\Documents and Settings\All Users\Application Data\Avenza\MAPublisher 8*
Windows Vista: *C:\ProgramData\Avenza\MAPublisher 8*
Mac OS X: *Applications/Avenza/MAPublisher 8/MAPublisher Plug-In/*

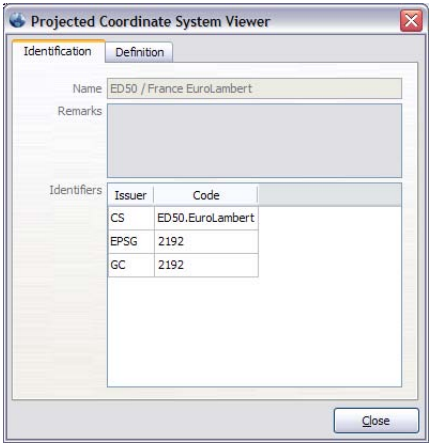
When using the **Save As** button, the xml and xvw files are saved in a directory chosen by the user. These files can then be exchanged between computers. Custom *xml* and *xvw* files are loaded into MAPublisher through the **MAP Views** panel options menu **Load Geodetic Datasource**.

NOTE: Please ensure that where the custom xml is saved there is a copy of the geocalc.xsd in the same folder, as this will be needed to load the file (geocalc.xsd is located in the Data Source Files folder as geodata.xml).

WORKING WITH GEODETIC DATASOURCE OBJECTS

Creating or editing objects will prompt the object's editor dialog box, each editor contains two tabs: Identification and Definition tabs.

The **Identification** tab of the editor is used to name the object and associate identifying codes with it (if applicable). First is the *Name* text box, this is where you need to enter the appropriate name for the definition; the name entered is the name that will be used to select the object in the main list. The *Remarks* text box can be used to add notes on a definition and is optional. The *Identifiers* list may be used to add identifying codes for an object that may come from other databases. The GC code is a unique identifier assigned by MAPublisher; do not alter this code. To enter additional codes use the spaces below. This tab is identical for all object types.

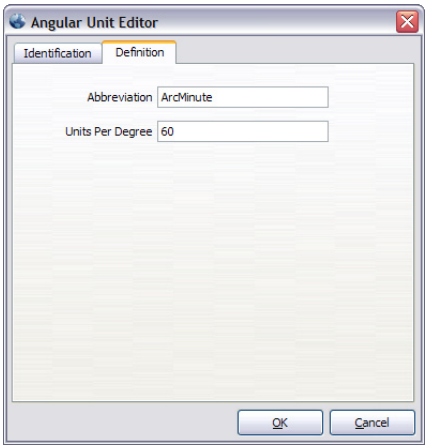


Geodetic Datasource object **Identification** tab

The **Definition** tab is used to define the object's parameters. Parameters are specific to each object type. Specific definition tabs per object are described here after.

Angular Units

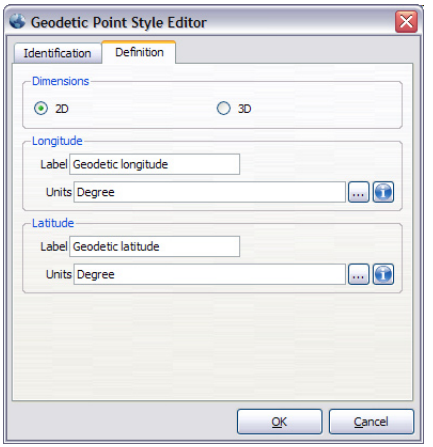
For Angular units you must enter a conversion for the new unit in terms of the scientific standard Degrees. The Abbreviation is used to identify the unit within the application interface (Example: The Abbreviation for Degrees is "deg").



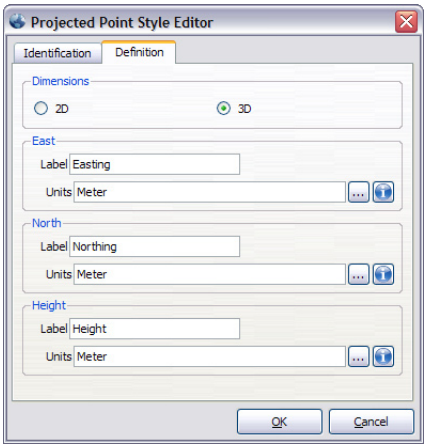
Angular Units Editor - Definition

Coordinate Points

For Coordinate Points you must specify the coordinate point dimensions in either 2D or 3D. For Geodetic and Projected Coordinate Points, the Longitude and Latitude style of units must be entered for all 2D. Dimensional Points. The Longitude, Latitude and Ellipsoid Height style of units must be entered for 3D Dimensional Points.



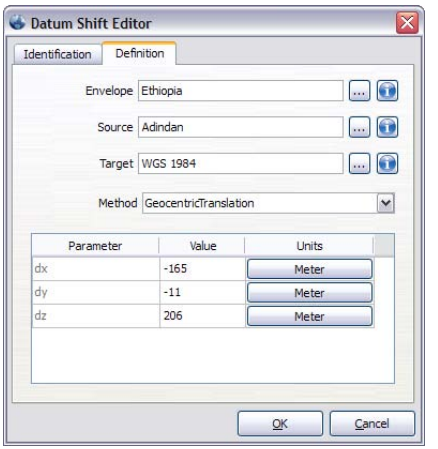
Geodetic Point Style Editor



Projected Point Style Editor

Datum Shifts

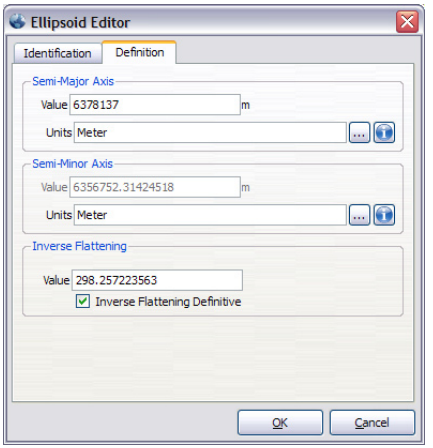
For Datum Shifts, you must select an Envelope (appropriate geographic area of use). If you are unsure of a more specific envelope, leave it se to the default *World* Envelope. The Source and Target text boxes are used to specify the two geodetic models the Transformation is valid for. The Method specifies the necessary parameters to define a particular datum transformation. With the proper method selected, enter the appropriate parameters for your datum transformation. Be sure to define the appropriate units for each parameter by clicking the Units button.



Datum Shift Editor

Ellipsoids

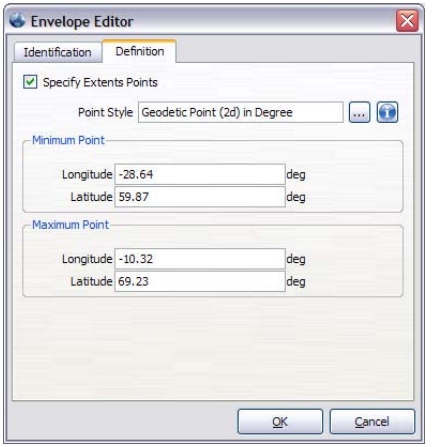
For Ellipsoids you must enter the parameters for the Semi-Major Axis and Semi-Minor Axis (often noted as "a" and "b" respectively) define the linear units the axes are specified in by selecting a predefined unit in the appropriate fields. The Inverse Flattening (often noted as "1/f") will automatically calculate in the field below. Alternately, you can make the Inverse Flattening definitive by enabling the check box at the bottom. You can then manually enter the Inverse Flattening rather than the Semi-Minor Axis parameter.



Ellipsoid Editor

Envelopes

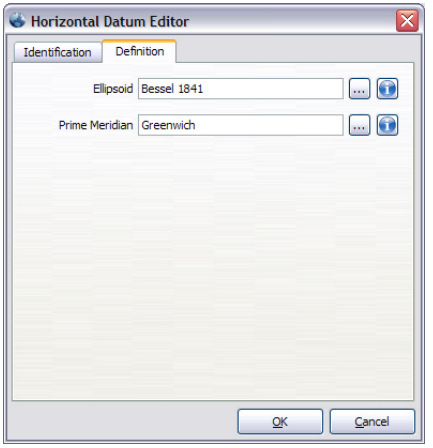
The use of an envelope is not required, but very much recommended to indicate the geographical extents where a given coordinate system is applicable. To define Envelopes you must select whether or not there are extents points, and if so, what point style they are in, and what the values of the minimum and maximum points are.



Envelope Editor

Horizontal Datums

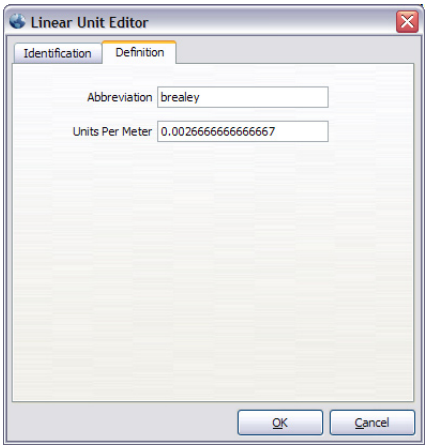
For Horizontal datums you must select the Ellipsoid the datum is based on, as well as the prime meridian used.



Horizontal Datum Editor

Linear Units

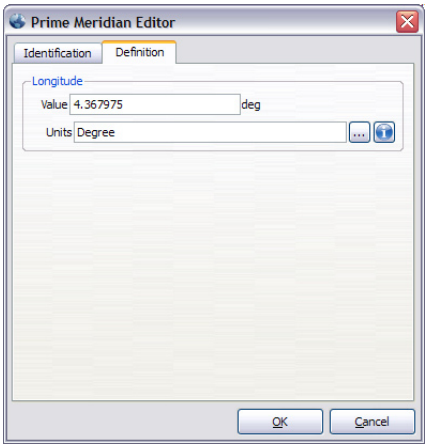
For Linear units you must enter a conversion for the new unit in terms of the scientific standard metres. The abbreviation is used to identify the unit within the application interface (Example: The Abbreviation for metres is "m").



Linear Unit Editor

Prime Meridians

For Prime Meridians you must enter the longitude value of the Prime Meridian and the angular unit that value is in.



Prime Meridian Editor

WORKING WITH COORDINATE SYSTEMS

A coordinate system within MAPublisher defines a mathematical model of the conversion between a specific location on the Earth and a set of coordinates. This model is specified by the Geodetic Datasource parameters, including the Earth model (ellipsoid or datum), the units used to measure the coordinates, the projection type, and any parameters specific to the projection type.

Geodetic coordinate systems use Latitude and Longitude to define the position on the Earth and incorporate angular units of measurement such as degrees.

Projected coordinate systems consist of a two or three dimensional system in which each point on the plane is defined by an x,y coordinate and having an origin where the axes intersect. Projected coordinate systems incorporate linear units of measurement for the measurement of area, distance and direction.

Within MAPublisher, coordinate systems are organized in coordinate system categories. This structure allows grouping into a logical collection for convenience (per continent, country or local sub-divisions).

The folders listed below represent the default schema for the coordinate systems in the **Geodetic Datasource** dialog box. Each folder option may be expanded by clicking the ⊞ node adjacent to the folder name.

-ALL-
(Lists all the coordinate systems available in the database)

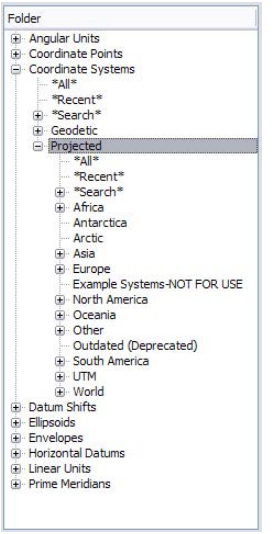
-RECENT-
(Lists the last 10 coordinate systems used)

-SEARCH _____-
(Lists the most recent results of a Search operation)

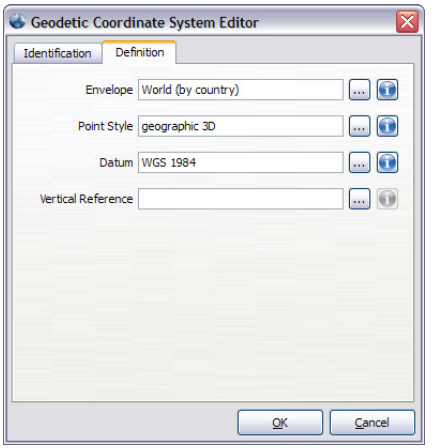
-GEODETIC-
(Lists the geodetic coordinate systems in the database)

-PROJECTED-
(Lists the projected coordinate systems in the database)

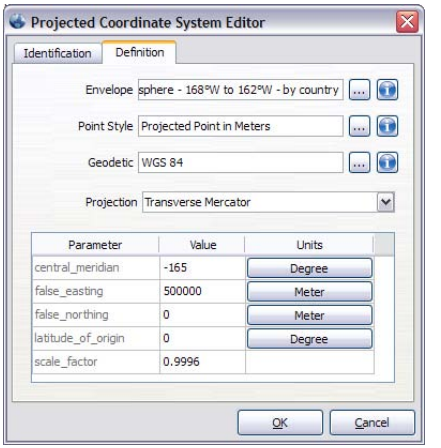
Projected coordinate system options



To define or edit Coordinate Systems, you must select an Envelope defining the appropriate area of use. If you are unsure of the appropriate envelope, you can leave it set to the default World envelope. The Point Style is how you will select the style of linear units for your system. For most systems, you will want to select *Projected point in _____* (appropriate units). Then select the Geodetic model that using the appropriate datum for your system. When you select the appropriate Projection for your system, the parameters needed to define the system will appear in the table below. Enter the needed parameters and define the units each parameter is specified in.



Geodetic Coordinate System Editor



Projected Coordinate System Editor

CREATE, EDIT AND DELETE GEODETIC DATASOURCE OBJECTS

Creating A New Object Category

1. Select **Edit Geodetic Datasource** from the options menu from the MAPublisher **MAP Views** panel.
2. When necessary, select the Geodetic or Projected category and then click the *New Category* button to create a new object category.

Deleting An Existing Object Category

1. Select **Edit Geodetic Datasource** from the options menu from the MAPublisher **MAP Views** panel.
2. When necessary, select the Geodetic or Projected category and then click the *Delete Category* button to delete an object category.

Creating A New Object Within A Category

1. Select **Edit Geodetic Datasource** from the options menu from the MAPublisher **MAP View***s* panel.
2. When necessary, select the Geodetic or Projected category and then click the *New Object* button to create a new object
3. In the New Object dialog box, Identification tab, enter a name for the new object.

NOTE: *The name must be unique.*

4. Select and enter the appropriate parameters for the envelope, point style, geodetic value, projection, vertical reference, angular unit, linear unit, or scale factor unit that the new object is based upon.

NOTE: *For a new coordinate system, the parameters themselves may be customized. Every parameter must be set in the following sequence: ellipsoid, datum, envelop, unit (angular or linear), geodetic system and then projected system....*

5. Press the **OK** button to create the object.
6. Press the **Save** button to commit your update to the Geodetic Datasource file.

Changing An Existing Object

1. Select **Edit Geodetic Datasource** from the options menu from the MAPublisher **MAP Views** panel.
2. Select the object, and choose the *Edit Object* button .
3. Enter the modified parameters for the envelope, point style, geodetic value, projection, vertical reference, angular unit, linear unit, oe scale factor unit where appropriate.
4. Press the **OK** button to commit your changes.
5. Press the **Save** button to commit your update to the Geodetic Datasource file.

Deleting An Existing Coordinate System Object

1. Select **Edit Geodetic Datasource** from the options menu from the MAPublisher **MAP Views** panel.
2. Select the object, and choose the *Delete Object* button .
3. Press the *OK* button to commit your changes.
4. Press the *Save* button to commit your update to the Geodetic Datasource file.

Copying An Existing Object

1. Select **Edit Geodetic Datasource** from the options menu from the MAPublisher **MAP Views** panel.
2. Select the object, and choose the *Copy Object* button .
3. Press the **OK** button to commit your changes.
4. Press the **Save** button to commit your update to the Geodetic Datasource file.

Renaming/Moving An Existing Object

1. Select **Edit Geodetic Datasource** from the options menu from the MAPublisher **MAP Views** panel.
2. Select the object, and choose the *Edit Object* button .
3. Enter the modified parameters for the identification name.
4. Press the **OK** button to commit your changes.
5. In order to move the coordinate system object, select the record and drag it to another category if necessary.
6. Press the **Save** button to commit your update to the Geodetic Datasource file.

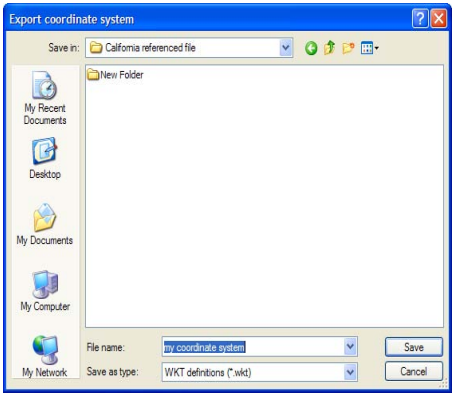
Saving Coordinate Systems xml file

1. Select **Edit Geodetic Datasource** from the options menu from the MAPublisher **MAP Views** panel.
2. Customized the coordinate systems (actions above)
3. Click the **Save As** button, type the file name

This file can be exchanged with another computer using MAPublisher using *Load Geodetic Datasource* (see page A2/6).

EXPORTING A REFERENCE FILE

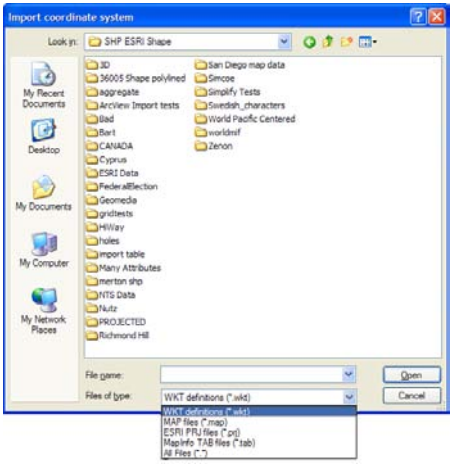
The defined coordinate system for a Map View can be exported as a reference *.wkt* file via MAPublisher **Export Coordinate System to File** option. Select **Export Coordinate System to File** from the **MAP Views** panel options menu to access the export dialog box where you can save the wkt definition.



Exporting a coordinate system

IMPORTING ADDITIONAL COORDINATE SYSTEM DEFINITIONS

By using the **Import Coordinate System from File** menu item in the MAPublisher **MAP Views** panel options menu, additional coordinate system definitions can be imported and merged with the existing datasource information. MAPublisher imports the following coordinate system file formats: WKT definitions (.wkt), MAP files (.map), ESRI PRJ files (.prj), and MapInfo TAB files (.tab).



Importing an Additional Datasource

NOTES:

- The Geodetic Datasource must be saved (**Save** or **Save As** button) after the import in order to be able to reuse it.
- New coordinate systems may also be added to the Geodetic Datasource during the map data import process; when the file coordinate system is not found in the existing lists of coordinate systems, it is automatically created with the proper required parameters.

Common Coordinate Systems

GEODETIC

A Geodetic Coordinate System is a three-dimensional coordinate system defined by an ellipsoid, the equatorial plane of the ellipsoidal and a plane defined along the polar axis (a meridional plane).

Coordinates in a Geodetic Coordinate System are given by a geodetic latitude (the angle between the normal to the ellipsoid at a location and the equatorial plane), a geodetic longitude (the angle between the meridional reference plane and a meridional plane containing the normal to the ellipsoid at a location) and a geodetic height (the perpendicular distance of a location from the ellipsoid).

A geodetic datum is the only required defining parameter for a Geodetic Coordinate System in MAPublisher. A geodetic datum defines constants that relate a Geodetic Coordinate System to the physical Earth, the dimensions of the reference ellipsoid, the location of the origin of the system, and the orientation of the system.

A geodetic coordinate is specified in MAPublisher by latitude, longitude, and ellipsoidal height values. Any angular unit defined within MAPublisher may be used to specify latitude and longitude coordinates.

The ellipsoidal height of a location is defined as the elevation of the location above the geoid (essentially a modeled surface representing mean sea level) and the separation of the geoid surface from the ellipsoidal surface. MAPublisher assumes a value of 0.0 if the ellipsoidal height of a location is unknown. Any distance unit defined within MAPublisher may be used to specify ellipsoidal height values.

UNIVERSAL TRANSVERSE MERCATOR

The Universal Transverse Mercator (UTM) Coordinate System is an international plane coordinate system developed by the U.S. Army. It extends around the globe from 84 degrees north to 80 degrees south. The world is divided into 60 zones in the Northern Hemisphere and 60 corresponding zones in the southern hemisphere. Each zone covers six degrees of longitude. Each zone extends three degrees eastward and three degrees westward from its central meridian. Zones are numbered west to east from the 180-degree meridian.

The geodetic datum and the UTM zone are required parameters for the UTM Coordinate System supported in MAPublisher.

A UTM coordinate is specified in MAPublisher by northing and easting values. The metre is the standard unit in the UTM coordinate system. Any distance unit defined within MAPublisher may be used to specify UTM coordinates.

US STATE PLANE

There are two State Plane Coordinate Systems defined in the United States, one based on the North American Datum of 1927 and the other based on the North American Datum of 1983.

Each of the State Plane Coordinate Systems divides the United States into over 130 sections, each with its own projection surface and grid network. With the exception of very narrow states, such as Delaware, New Jersey, and New Hampshire, most states divide into two to ten zones.

Zones extending primarily in an east-west direction are based on the Lambert Conformal Conic Projection, while zones extending in a north-south direction are based on the Transverse Mercator Projection. Alaska, Florida and New York use both Transverse Mercator and Lambert Conformal Conic for different areas. The Aleutian panhandle of Alaska uses the Oblique Mercator Projection.

Zone boundaries follow state and county lines and, because each zone is small, distortion is less than one in 10,000. Each zone has a centrally located origin and a central meridian that passes through the origin. The United States uses a two-zone numbering system: The United States Geological Survey (USGS) Code System and the National Ocean Service (NOS) Code System. However, other code systems do exist.

The State Plane zone is the only required defining parameter for any of the State Plane Coordinate Systems supported in MAPublisher.

IT IS STRONGLY RECOMMENDED THAT YOU USE THE NGS NADCON GEODETIC DATUM TRANSFORMATION METHOD WHEN CONVERTING STATE PLANE COORDINATES. HOWEVER, YOU MAY USE THE MOLODENSKY METHOD WHEN CONVERTING STATE PLANE COORDINATE SYSTEM OF 1927 COORDINATES AND SELECT ONE OF THE DEFINED SET OF NAD 27 DATUM TRANSFORMATIONS.

A State Plane coordinate is specified in MAPublisher by northing and easting values. The U.S. Survey Foot is the standard unit in the State Plane Coordinate System of 1927. The metre is the standard unit in the State Plane Coordinate System of 1983. Any distance unit defined within MAPublisher may be used to specify State Plane coordinates.

MAPublisher Supported Projections

This section helps you become familiar with the map projections that are supported in MAPublisher

AITOFF

The Aitoff projection is a modified azimuthal projection that is neither conformal nor equal area. It was developed by David Aitoff (or Altow) in 1889. The central meridian is a straight line half the length of the Equator. Other meridians are equally spaced along the Equator and concave toward the central meridian. The Equator is straight. Other parallels are equally spaced along the central meridian and concave toward the nearest pole. The poles are represented by points. This projections is symmetrical about the Equator and the central meridian. Scale is true along the Equator and the central meridian.

This projection is supported on spheres only.

Aitoff projection requires the following parameters:

- *Longitude of the Center of the Projection*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

ALASKA STATE PLANE 27

The State Plane Coordinate System (SPCS) is not a projection; rather it is a system for specifying positions of geodetic stations using plane rectangular coordinates. This coordinate system that divides all fifty states of the United States, Puerto Rico and the U.S. Virgin Islands into over 120 numbered sections, referred to as zones. Each zone has an assigned code number that defines the projection parameters for the region.

There are four possible projections for SPCS. The geometric direction of each state determines the projection utilized. For states that are longer in the east-west direction, the Lambert Conformal Conic is used. States which are longer in the north-south direction use the Transverse Mercator Projection. The panhandle of Alaska, which the sole distinction of lying at an angle, garners the use of the Oblique Mercator Projection. While Guam uses a Polyconic projection

The formulae for these calculations are based on Publication 62-4, **State Plane Coordinates by Automatic Data Processing**, U.S. Department of Commerce 1968. These projections should only be used for data that has been computed using this method. For all other state plane calculations use Exact Methods. The parameters for these coordinate systems are defined in Publication 62-4. For further information, contact the U.S. Department of Commerce.

The **Alaska27** projection is hard-coded and does not require any parameters.

ALBERS EQUAL-AREA CONIC

The Albers Equal-Area Conic projection is a map projection in which the parallels are unequally spaced arcs of concentric circles spaced closer to each other near the north and south edges of the map. The meridians are equally spaced and intersect the parallels at right angles.

The Albers Equal-Area Conic projection is used for equal-area maps of regions with predominant east-west expanse, such as the United States. It is used exclusively by the USGS for sectional maps of all 50 states.

When **Albers Equal Area** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Central Meridian*
- *Latitude of the Origin of the Projection*
- *Latitude of Southern Standard Parallel*
- *Latitude of Northern Standard Parallel*

AZIMUTHAL EQUAL AREA

The Azimuthal Equal Area projection is an equal-area projection with the azimuthal property showing true directions from the center of the projection. Its scale at a given distance from the center varies less from the scale at the center than the scale of any of the other azimuthal projections.

When **Azimuthal Equal Area** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Center of the Projection*
- *Latitude of the Center of the Projection*

AZIMUTHAL EQUAL AREA (POLAR ASPECT)

The Azimuthal Equal Area (Polar Aspect) projection is an equal-area projection with the azimuthal property showing true directions from the center of the projection. Its scale at a given distance from the center varies less from the scale at the center than the scale of any of the other azimuthal projections. All meridians in the polar aspect are straight lines.

The **PolarAzimuthalEqualArea** projection has the following parameters:

- *Longitude of Origin*
- *Latitude of Origin*
- *False Easting*
- *False Northing*

AZIMUTHAL EQUIDISTANT

The Azimuthal Equidistant projection is neither an equal-area nor a conformal projection. The outer meridian of a hemisphere on the equatorial aspect is a circle. Distances and directions measured from the center are true. We recommend using the Azimuthal Equidistant projection for coordinate systems in which distances are measured from an origin.

The Azimuthal Equidistant projection is used in oblique aspect for atlas maps of continents, and in world maps for aviation.

When **Azimuthal Equidistant** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Central Meridian*
- *Latitude of Origin of Projection*

AZIMUTHAL EQUIDISTANT (POLAR ASPECT)

The Azimuthal Equidistant (Polar Aspect) projection is neither an equal-area nor a conformal projection. The outer meridian of a hemisphere on the equatorial aspect is a circle. Parallels on the polar projection are circles spaced at equidistant intervals. All meridians on the polar aspect are straight lines. Distances and directions measured from the center are true.

The **Azimuthal Equidistant (Polar Aspect)** projection is used in the polar aspect for world maps and maps of the polar hemispheres.

The **PolarEquidistant** projection has the following parameters:

- *Longitude of the Central Meridian*
- *Latitude of the Origin of the Projection*
- *False Easting*
- *False Northing*

BEHRMANN

The Behrmann projection is a variation of the generic Equal Area Cylindrical, in which the latitude of the standard parallel is always 30 degrees. It was originally presented by Walter Behrmann in Berlin in 1910. The Equal-Area Cylindrical projection represents an orthographic projection of a sphere onto a cylinder. Like other regular cylindrical projections, the graticule of the normal Equal-Area Cylindrical projection consists of straight equally spaced vertical meridians perpendicular to straight unequally spaced horizontal parallels. To achieve equality of area, the parallels are spaced form the Equator in proportion to the sine of the latitude.

This is the simplest equal-area projection. This projection is supported on spheres only. The **Behrmann** projection has the following parameters:

- *Longitude of the Central Meridian*
- *False Easting*
- *False Northing*

BELGIUM 72

The Belgium 72 Projection is a special case of the Lambert Conformal Conic (2-parallel) projection.

The **Belgium72** projection has the following parameters:

- *Longitude of the Central Meridian*
- *Latitude of the Origin of the Projection*
- *Latitude of Southern Standard Parallel*
- *Latitude of Northern Standard Parallel*
- *False Easting*
- *False Northing*

BIPOLAR OBLIQUE CONIC CONFORMAL

This conformal projection was constructed specifically for mapping North and South America. It is composed of two oblique adaptations of the Lambert Conformal Conic projection. The juncture of the two conic projections consists of a great circle arc cutting through Central America from southwest to northeast.There is a slight mathematical discontinuity along this arc, which is resolved by an adjustment that leaves a small intermediate area slightly non-conformal. The Earth is treated as a sphere by this projection, due to the relatively small scale of the map.

The **Bipolar Oblique Conformal Conic** projection has no parameters, as the poles and parallels used by the conic projections are set to specific values.

BONNE

The Bonne projection is psuedoconical and equal-area. The central meridian is a straight line.
Other meridians are complex curves. Parallels are concentric circular arcs, but the poles are points.
Scale is true along the central meridian and along all parallels. There is no distortion along the central meridian and along the standard parallel. The Bonne projection is used for atlas maps of continents and for topographic mapping of some countries.

When **Bonne** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Central Meridian*
- *Latitude of Standard Parallel*

CASSINI

The Cassini projection is a cylindrical projection. It is neither equal-area or conformal. The central meridian, each meridian 90 degrees from the central meridian and the Equator are straight lines. Other meridians and parallels are complex curves. Scale is true along the central meridian and along lines perpendicular to the central meridian. Scale is nearly constant but not true along lines parallel to the central meridian. The Cassini projection has been used for topographic mapping in England and currently in a few other countries. When **Cassini** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Central Meridian*
- *Latitude of True Scale*

CRASTER PARABOLIC

The Craster Parabolic projection is a pseudocylindrical, equal area projection used for thematic world maps in textbooks. It was originally presented by John Evelyn Edmund Craster in 1929. It was further developed by Charles H. Deetz and O.S. Adams in 1934. The central meridian is a straight line half as long as the Equator. Other meridians are equally spaced parabolas intersecting at the poles and concave toward the central meridian. The parallels are unequally spaced, farthest apart near the Equator. They run perpendicular to the central meridian. This projection is symmetrical about the central meridian or the equator. Scale is true along latitudes 36°46′ N and S, and constant along any given latitude. This projection is supported on spheres only.

This projection is also known as Putniņš P4, which was independently presented in Latvia in 1934.

The **CrasterParabolic** projection has the following parameters:

- *Longitude of the Central Meridian*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

DANISH SYSTEM 34

(Pre–1999 variation, using order 11 polynomial)

This projection is a variation of the Transverse Mercator projection used in Denmark, and is also referred to as UTS34. The projection consists of a base UTM (zones 32 and 33) calculation, which is then adjusted by an order 11 polynomial. The polynomials used in the Danish System 34 projection were developed by K. Poder and K. Engsager of Kort and Matrikelstyrelsen. The polynomial coefficients can be obtained by contacting Kort and Matrikelstyrelsen.

Note that this projection was superseded in 1999, by a newer version that uses an order 13 polynomial to further adjust the results achieved using this projection.

The **DanishSystem34** projection has the following parameters:

- *Region*

Region is used to indicate which part of Denmark the projection is being applied to. The valid region values are as follows:

Region	Key
Jylland	"j", "J", or "1"
Sjælland	"s", "S", or "2"
Bornholm	"b", "B", or "3"
National	"u", "U", or "4"

DANISH SYSTEM 34 (1999)

(1999 variation, using order 13 polynomial)

This projection is a variation of the Transverse Mercator projection used in Denmark. The projection consists of a base UTM (zones 32 and 33) calculation, which is then adjusted by an order 11 polynomial, and then further adjusted by an order 13 polynomial. Note that a previous version of this projection was used up until 1999, based solely on the order 11 polynomial. This newer version is a further refinement of those results using the additional order 13 polynomial.

The polynomials used in the Danish System 34 projection were developed by K. Poder and K. Engsager of Kort and Matrikelstyrelsen. The polynomial coefficients can be obtained by contacting Kort and Matrikelstyrelsen.
The **DanishSystem34_99** projection has the following parameters:

- *Region*

Region is used to indicate which part of Denmark the projection is being applied to. The valid region values are as follows:

Region	Key
Jylland	"j", "J", or "1"
Sjælland	"s", "S", or "2"
Bornholm	"b", "B", or "3"
National	"u", "U", or "4"

DOUBLE STEREOGRAPHIC

The Double Stereographic projection consists of two mappings. First, the ellipsoidal data is mapped to a conformal sphere. Then a second conformal mapping is done of the spherical data to the plane. This projection is used in New Brunswick, Canada.

When **Double Stereographic** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Center of the Projection*
- *Scale Reduction Factor at the Center of the Projection*
- *Latitude of the Center of the Projection*

ECKERT I

The Eckert I projection is a pseudocylindrical projection that is neither conformal nor equal area. This projection was presented by Max Eckert in 1906, and is generally used for novelty maps of the world showing a straight-line graticule. Meridians in this projection are represented by equally spaced converging straight lines broken at the equator. The central meridian is half as long as the Equator. Parallels are represented by equally spaced straight parallel lines that are perpendicular to the central meridian. Poles are represented by lines half as long as the Equator. This projection is symmetrical about the central meridian or the Equator. Scale is true along latitudes 47°10′ N and S, and constant along any given latitude or meridian.

The **EckertI** projection has the following parameters:

- *Longitude of the Center of the Projection*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) issued for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

ECKERT II

The Eckert II projection is a pseudocylindrical projection that is equal area. This projection was presented by Max Eckert in 1906, and is generally used for novelty maps of the world showing a straight-line equal area graticule. Meridians in this projection are represented by equally spaced converging straight lines broken at the equator. The central meridian is half as long as the Equator. Parallels are represented by unequally spaced straight parallel lines that are perpendicular to the central meridian. Poles are represented by lines half as long as the Equator. This projection is symmetrical about the central meridian or the Equator. Scale is true along latitudes 55°10′ N and S, and constant along any given latitude.
This projection is supported on spheres only. The **Eckert II** projection has the following parameters:

- *Longitude of the Center of the Projection*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the syste wherein this projection is incorporated.

ECKERT III

The Eckert III projection is a pseudocylindrical projection that is neither conformal nor equal area. This projection was presented by Max Eckert in 1906 and is used primarily for world maps. Meridians in this projection are equally spaced semi-ellipses, concave toward the central meridian. The central meridian is a straight line half as long as the Equator. Parallels are represented by equally spaced straight parallel lines that are perpendicular to the central meridian. Poles are represented by lines half as long as the Equator. This projection is symmetrical about the central meridian or the Equator. Scale is true along latitudes 35°58′ N and S, and constant along any given latitude.

The **EckertIII** projection has the following parameters:

- *Longitude of the Center of the Projection*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

ECKERT IV

The Eckert IV was created by Max Eckert in 1906, and is used for world maps. Both are Pseudocylindrical projections whose central meridian is a straight line. 180th meridians of the Eckert IV projection are semicircle, and all other meridians are equally spaced elliptical Arcs. The parallels are unequally spaced straight lines parallel to one another, and the Poles are straight lines half as long as the equator. Scale is true along latitude 40º30′ for the Eckert IV.

The **EckertIV** projection has the following parameters:

- *Longitude of the Central Meridian*
- *Latitude of Origin*
- *Radius of the Sphere*
- *False Northing*
- *False Easting*

NOTE: If the spherical_radius parameter is set to a value greater than zero, then it will be used as the radius of the sphere. If this parameter is set to a value less than or equal to zero, then the semi-major radius of the ellipsoid will be used as the radius of the sphere.

ECKERT V

The Eckert V projection is a pseudocylindrical projection that is neither conformal nor equal area. This projection was presented by Max Eckert in 1906. Meridians in this projection are equally spaced sinusoids, concave toward the central meridian. The central meridian is a straight line half as long as the Equator. Parallels are represented by equally spaced straight parallel lines that are perpendicular to the central meridian. Poles are represented by lines half as long as the Equator. This projection is symmetrical about the central meridian or the Equator. Scale is true along latitudes 37°55' N and S, and constant along any given latitude.

The **EckertV** projection has the following parameters:

- *Longitude of Origin*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

ECKERT VI

The Eckert VI was created by Max Eckert in 1906, and is used for world maps. Both are Pseudocylindrical projections whose central meridian is a straight line. Meridians on the Eckert VI projection are equally spaced sinusoidal curves. In both projections, the parallels are unequally spaced straight lines parallel to one another, and the Poles are straight lines half as long as the equator. Scale is true along latitude 49º16' for Eckert VI.
The **EckertVI** projection has the following parameters:

- *Longitude of Origin*
- *Latitude of Origin*
- *Radius of Sphere*
- *False Easting*
- *False Northing*

NOTE: If the spherical_radius parameter is set to a value greater than zero, then it will be used as the radius of the sphere. If this parameter is set to a value less than or equal to zero, then the semi-major radius of the Ellipsoid will be used as the radius of the sphere.

EGYSEGES ORSZAGOS VETULET (EOV)

The Egyseges Orszagos Vetulet (EOV) is a conformal cylindrical projection in transversal position used uniformly for the Hungarian civilian base maps and, in general, for spatial informatics.

The current implementation for the **EgysegesOrszagosVetulet** projection does not require any user defined parameters.

EQUAL-AREA CYLINDRICAL

The Equal-Area Cylindrical projection represents an orthographic projection of a sphere onto a cylinder. Like other regular cylindrical projections, the graticule of the normal Equal-Area Cylindrical projection consists of straight equally spaced vertical meridians perpendicular to straight unequally spaced horizontal parallels. To achieve equality of area, the parallels are spaced form the Equator in proportion to the sine of the latitude. This is the simplest equal-area projection.

When **Equal-Area Cylindrical** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Central Meridian*
- *Latitude of the Standard Parallel*

EQUIDISTANT CONIC

The Equidistant Conic is the simplest kind of conic projection. It is the projection most likely to be found in atlases of small countries, with its equally spaced straight meridians and equally spaced circular parallels.

When **Equidistant Conic** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Central Meridian*
- *Latitude of the Origin of the Projection*
- *Latitude of the Southern Standard Parallel*
- *Latitude of the Northern Standard Parallel*

EQUIDISTANT CYLINDRICAL

The Equidistant Cylindrical projection is probably the simplest of all map projections to construct and one of the oldest. Meridians and parallels are equidistant straight lines, intersecting at right angles. Poles are shown as lines. This projection is used only in spherical form.

If the Equator is made the standard parallel, true to scale and free of distortion, the meridians are spaced at the same distances as the parallels, and the graticule appears square. This form is often called the Plate Carree or the Simple Cylindrical Projection.

When **Equidistant Cylindrical** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *Radius of the Sphere*
- *Longitude of the Central Meridian*
- *False Northing and False Easting*
- *Latitude of True Scale*

NOTE: Only a spherical form of this projection is used. The radius of the sphere is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated. You are required to specify a geodetic datum when you use this projection as part of a coordinate system in order to perform geodetic datum shifts into other coordinate systems.

EUROPEAN STEREOGRAPHIC

The European Stereographic projection is a derivation of the Stereographic projection for use in the Netherlands.

When **European Stereographic** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Center of the Projection*
- *Latitude of the Center of the Projection*
- *Scale Reduction Factor at the Center of the Projection*

FULLER (DYMAXION)

R. Buckminster Fuller Dymaxion Projection is a method of projecting the spherical Earth onto a twenty-sided polyhedron known as an icosahedron. This icosahedron is then unfolded in such a way that the major land masses will appear whole, without the map borders breaking them apart. More information may be found at the Buckminster Fuller Institute (*www.bfi.org*).

The **Fuller** projection has no parameters.

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

For more information about the map and the work of Buckminster Fuller, visit the Buckminster Fuller Institute at *www.bfi.org*. The Fuller Projection Map design is a trademark of the Buckminster Fuller Institute © 1938, 1967, 1992. All rights reserved. *www.bfi.org*.

GALL STEREOGRAPHIC

The Gall Stereographic projection is a cylindrical perspective projection that is neither conformal nor equal area. It is produced geometrically by projecting the Earth perspectively from the point on the Equator opposite a specified meridian, onto a secant cylinder cutting the globe at latitudes 45° N and S. It was presented by James Gall in 1855. It is sometimes known simply as the Gall projection, or as Gall Stereographic projection. This projection is used primarily for world maps in British atlases and some other atlases. It resembles the Mercator, but has less distortion of scale and area near the poles.

The meridians in the Gall Stereographic projection are equally spaced straight parallel lines .77 as long as the Equator. Parallels are unequally spaced straight parallel lines perpendicular to meridians. The poles are represented by straight lines equal in length to the Equator. The projection is symmetrical about any meridian or the Equator. Scale is true along latitudes 45° N and S in all directions, and is constant in any given direction along any other latitude. There is no distortion at latitudes 45° N and S, but shape, area and scale distortion increase moderately away from these latitudes and become severe at the poles.

The **GallStereographic** projection has the following parameters:

- *Longitude of Origin*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

GNOMIC

The Gnomic projection is used for plotting great circle arcs as straight lines on a map. Scale, shape and area are badly distorted along these paths, but the great circle routes are precise in relation to the sphere.

When **Gnomic** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Center of the Projection*
- *Latitude of the Center of the Projection*
- *Radius of the Sphere*

GOODE HOMOLOSINE

The Goode Homolosine projection is a pseudocylindrical composite projection that is equal area. It is used primarily for world maps in a number of atlases, including Goode Atlas (Rand McNally). It was developed by J. Paul Goode in 1923 as a merging of the Mollweide (or Homolographic) and Sinusoidal Projections, thus giving rise to the name **Homolosine**.

Each of the six central meridians is a straight line 0.22 as long as the Equator, but not crossing the Equator. Other meridians are equally spaced sinusoidal curves between latitudes 40°44′ N and S. The poles are represented by points. Scale is true along every latitude between 40°44′ N and S and along the central meridian within the same latitude range.

The **GoodeHomolosine** projection has the following parameters:

- *Longitude of Origin*
- *False Northing*
- *False Easting*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) issued for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

GUAM STATE PLANE 27

The State Plane Coordinate System (SPCS) is not a projection; rather it is a system for specifying positions of geodetic stations using plane rectangular coordinates. This coordinate system that divides all fifty states of the United States, Puerto Rico and the U.S. Virgin Islands into over 120 numbered sections, referred to as zones. Each zone has an assigned code number that defines the projection parameters for the region.

There are four possible projections for SPCS. The geometric direction of each state determines the projection utilized. For states that are longer in the east-west direction, the Lambert Conformal Conic is used. States which are longer in the north-south direction use the Transverse Mercator Projection. The panhandle of Alaska, which the sole distinction of lying at an angle, garners the use of the Oblique Mercator Projection. While Guam uses a Polyconic projection.

The formulae for these calculations are based on Publication 62-4, *State Plane Coordinates by Automatic Data Processing*, U.S. Department of Commerce 1968. These projections should only be used for data that has been

computed using this method. For all other state plane calculations use Exact Methods. The parameters for these coordinate systems are defined in Publication 62-4. For further information contact the U.S. Department of Commerce.

The **Guam27** projection does not require any parameters.

HAMMER AITOFF

The Hammer Aitoff (or simply Hammer) projection is a modified azimuthal projection that is equal area. H.H. Ernst von Hammer developed it in 1892. It is used most often for whole-world maps.

In this projection, the central meridian is depicted as a straight line half the length of the Equator. Other meridians are depicted as complex curves, unequally spaced along the Equator and concave toward the central meridian. The Equator is straight. Other parallels are depicted as complex curves, unequally spaced along the central meridian and concave toward the nearest pole. The poles themselves are represented by points. This projection is symmetrical about the central meridian and the Equator. Scale decreases along the central meridian and the Equator as you move away from the center.

This projection has moderate distortion, with less shearing action on the outer meridians near the poles than may be found in pseudocylindrical projections.

The **HammerAitoff** projection has the following parameters:

- *Longitude of Origin*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

HOTINE OBLIQUE MERCATOR (RECTIFIED SKEW ORTHOMORPHIC)

The Hotine Oblique Mercator (HOM) projection is a cylindrical, conformal map projection. It is similar to the Mercator projection, except that the cylinder is wrapped around the sphere so that it touches the surface along the great circle path chosen for the central line, instead of along the Earth's equator. Scale becomes infinite 90 degrees from the central line and is true along a chosen central line, along two straight lines parallel to the central line, or along a great circle at an oblique angle. The HOM projection is used for geographic regions that are centered along lines that are neither meridians nor parallels, but that may be taken as great circle routes passing through the region, such as the Alaskan panhandle. Two cases of the Hotine Oblique Mercator projection are implemented within MAPublisher, differing only in their defining parameters.

The **Hotine Oblique Mercator** projection has the following parameters:

- *False Northing and False Easting*
- *Latitude of the Origin of the Projection*
- *Scale factor*
- *Standard Longitude 1st and 2nd Points*
- *Standard parallel 1st and 2nd Points*

The Rectified Skew Orthomorphic (RSO) projection is used throughout the world, particularly in Malaysia. The RSO projection is equivalent to a HOM projection except that the defining parameters are different. You can specify a HOM projection by specifying a point and the azimuth defining the central line. This case allows for the entering of parameters for the RSO projection.

When **Hotine Oblique Mercator (1 Point) or** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Latitude of the Origin of the Projection*
- *Longitude at the Center of the Projection*
- *Azimuth of the Central Line*
- *Scale Factor at the Center of the Projection*
- *Skew Azimuth*

NOTE: The Skew Azimuth parameter is essential for correct rectified to skew coordinate transformation. If you have researched a coordinate system and there is no defined skew angle simply enter the azimuth of the central line as the skew angle. This will provide for an identity rectified to skew transformation.

There are two variations of the Hotine Oblique Mercator (1 Point) projection type. These are mathematically identical in terms of results returned. The only difference is that the **Hotine Oblique Mercator (1 Point) Method 2** version uses hyperbolic functions in the underlying mathematical computations.

IMW POLYCONIC

The IMW Polyconic projection is a modified Polyconic projection devised as a basis for the1:1,000,000 scale International Map of the World (IMW) series. The IMW Polyconic projection differs from the ordinary Polyconic in two principle ways. All meridians are straight and two meridians are made true to scale.

When **IMW Polyconic** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of Central Meridian*
- *Latitude of the Southern Standard Parallel*
- *Latitude of the Northern Standard Parallel*
- *Longitude of the Meridian True to Scale*

KROVAK

The Krovak projection was created and used in Czechoslovakia in the early part of the 20th century. It is an oblique version of the Lambert Conformal Conic projections with a pseudo standard parallel that intersects the centerline of the projection at a defined azimuth. The projection accurately preserves scale and area along the pseudo standard parallel. It is primarily used in the Czech Republic.

When **Krovak** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Origin Latitude*
- *Origin Longitude (centerline)*
- *Latitude of True Scale*
- *Azimuth*

LABORDE

The Laborde projection is an Oblique Mercator projection that is primarily used in Madagascar. It is a cylindrical, conformal map projection similar to the Mercator system, except the cylinder is wrapped around the sphere so that it touches the surface along the great circle path at a chosen azimuth from the centerline. It was adopted for use in the Madagasgar grid system in 1926.

When **Laborde** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Origin Latitude*
- *Origin Longitude (centerline)*
- *Scale Factor*
- *Azimuth*

LAMBERT CONFORMAL CONIC (2 PARALLELS)

The Lambert Conformal Conic (2 parallel) projection is a map projection in which the scale is true along two standard parallels, and the true shape of small areas is preserved. Parallels are unequally spaced arcs of concentric circles spaced closer to each other near the center of the map. The meridians are equally spaced and intersect the parallels at right angles. The scale is true along two standard parallels.

The Lambert Conformal Conic projection is widely used in atlases, in aeronautical charts, and in plane coordinate systems in surveying. It is also used in the State Plane Coordinate System for states with large east-west extents.

When **Lambert Conformal Conic** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Central Meridian*
- *Latitude of the Origin of the Projection*
- *Latitude of the Southern Standard Parallel*
- *Latitude of the Northern Standard Parallel*

LAMBERT CONFORMAL CONIC EXTENDED

This is a variation of the standard Lambert Conformal Conic projection that is provided for the definition of coordinate systems used in specific counties in the U.S. states of Minnesota and Wisconsin. Within a specific county in one of these states, the ellipsoid must be expanded by an additional amount to account for the average elevation within that county. In the case of a Wisconsin county, the ellipsoid must also be adjusted based on the average geoid height for that county. For Minnesota counties, the average geoid height should be set to zero.

The **LambertConformalConicExtended** projection has the following parameters:

- *Longitude of Origin*
- *Latitude of Origin*
- *Scale Factor at projection center*
- *False Easting*
- *False Northing*
- *Average Elevation (Minnesota and Wisconsin)*
- *Average Geoid Height (Wisconsin-only)*

LAMBERT TANGENT

The Lambert Tangent projection is a map projection in which the scale is true along a single standard parallels, and the true shape of small areas is preserved. This projection is also known as Lambert Conformal Conic (1 parallel. Parallels are unequally spaced arcs of concentric circles spaced closer to each other near the center of the map. The meridians are equally spaced and intersect the parallels at right angles. Coordinate systems based on this projection are used extensively in France.

When **Lambert Tangent** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Center of the Projection*
- *Latitude of the Origin of the Projection*
- *Scale Factor at the Center of the Projection*

LAMBERT STATE PLANE 27

The State Plane Coordinate System (SPCS) is not a projection; rather it is a system for specifying positions of geodetic stations using plane rectangular coordinates. This coordinate system that divides all fifty states of the United States, Puerto Rico and the U.S. Virgin Islands into over 120 numbered sections, referred to as zones. Each zone has an assigned code number that defines the projection parameters for the region.

There are four possible projections for SPCS. The geometric direction of each state determines the projection utilized. For states that are longer in the east-west direction, the Lambert Conformal Conic is used. States that are longer in the north-south direction use the Transverse Mercator Projection. The panhandle of Alaska, which has the sole distinction of lying at an angle, garners the use of the Oblique Mercator Projection. Conversely Guam uses a Polyconic projection.

The formulae for these calculations are based on Publication 62-4, *State Plane Coordinates by Automatic Data Processing*, U.S. Department of Commerce 1968. These projections should only be used for data that has been computed using this method. For all other state plane calculations use Exact Methods. The parameters for these coordinate systems are defined in Publication 62-4. For further information contact the U.S. Department of Commerce.

The **Lambert27** projection does not require any parameters.

LOXIMUTHAL

The Loximuthal projection is a pseudocylindrical projection that is neither conformal nor equal area. It was presented by Karl Siemon in 1935, and independently as Loximuthal by Waldo R. Tobler. This projection has the special feature that loxodromes (rhumb lines) from the central point (the intersection of the central meridian and central latitude) are shown straight, true to scale, and correct in azimuth from the center. The azimuths with respect to other points along a rhumb line, however, are not shown correctly, due to angular distortion on the map projection.

The central meridian in the Loximuthal projection is a straight line generally over half as long as the Equator (depending on the central latitude). Other meridians are depicted as equally spaced complex curves that are concave toward

the central meridian and which intersect at the poles. The parallels are equally spaced straight parallel lines running perpendicular to the central meridian. The poles are represented as points. The projection in symmetrical about the central meridian, and around the Equator in the case where the central latitude is the Equator. Scale is true along the central meridian, and is constant along any given latitude. Distortion varies from moderate to extreme, and is absent only at the intersection of the central latitude and central meridian.

The **Loximuthal** projection has the following parameters:

- *Longitude of Origin*
- *Latitude of Origin*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

MCBRYDE-THOMAS FLAT-POLAR QUARTIC

The McBryde-Thomas Flat-Polar Quartic projection is a pseudocylindrical, equal area projection. It was presented by F. Webster McBryde and Paul D. Thomas in 1949. It is primarily used for examples in various geography textbooks, and is sometimes known simply as the Flat-Polar Quartic projection.

The central meridian is a straight line 0.45 as long as the Equator. Other meridians are fourth-order (quartic) curves that are equally spaced and concave toward the central meridian. The parallels are unequally spaced straight parallel lines, spaced farthest apart near the Equator and running perpendicular to the central meridian. The poles are represented by lines one-third as long as the Equator. Scale is true along latitudes 33°45′ N and S, and is constant along any given latitude. Distortion is severe near the outer meridians at high latitudes. This projection is free of distortion only at the intersection of the central meridian with latitudes 33°45′ N and S.

The **McBrydeThomasFlatPolarQuartic** projection has the following parameters:

- *Longitude of Origin*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

MERCATOR

The Mercator projection is a cylindrical, conformal map projection in which meridians and parallels are straight lines that cross at 90-degree angles. Angular relationships are preserved. To preserve conformity, parallels are placed increasingly farther apart with increasing distance from the equator. This results in extreme distortion at high latitudes. Scale is true along the equator or along two parallels equidistant from the equator. Despite its drawbacks, the Mercator projection is quite useful for navigation because rhumb lines, which show constant direction, are straight. The Mercator projection is also appropriate for conformal maps of equatorial regions.

When **Mercator** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Latitude of True Scale*
- *Longitude of the Central Meridian*

MILITARY GRID REFERENCE SYSTEM

The Military Grid Reference System projection is an extension of the UTM system (between 80° south and 80° north latitude) which uses a standard-scaled grid square, based on a point of origin on a map projection of the surface of the Earth in an accurate and consistent manner to permit either position referencing or the computation of direction and distance between grid positions.

The **MilitaryGridReferenceSystem** projection has no parameters.

MILLER CYLINDRICAL

Meridians and parallels are straight lines, intersecting at right angles on the Miller Cylindrical projection. Poles are shown as lines. This projection is used only in spherical form and provides a compromise between Mercator and other cylindrical projections.

When **Miller Cylindrical** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *Radius of the Sphere*
- *False Northing and False Easting*
- *Longitude of the Central Meridian*

NOTE: Only a spherical form of this projection is used. The radius of the sphere is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated. You are required to specify a geodetic datum when you use this projection as part of a coordinate system in order to perform geodetic datum shifts into other coordinate systems.

MOLLWEIDE

The Mollweide projection is a pseudocylindrical equal-area projection. The central meridian is a straight line, 90th meridians are circular arcs, and all other meridians are equally spaced elliptical arcs. Parallels are unequally spaced straight lines, parallel to each other. Poles are shown as points. This projection is used only in spherical form. When **Mollweide** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *Radius of the Sphere*
- *False Northing and False Easting*
- *Longitude of the Central Meridian*

NOTE: Only a spherical form of this projection is used. The radius of the sphere is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated. You are required to specify a geodetic datum when you use this projection as part of a coordinate system in order to perform geodetic datum shifts into other coordinate systems.

NEW ZEALAND MAP GRID

The New Zealand Map Grid (NZMG) is a projection that is used to convert latitudes and longitudes to easting and northing coordinates used for most mapping of New Zealand. The projection is unique to New Zealand. It was designed by Dr W. I. Reilly (1973) to minimize the scale error over the land area of the country.

The **NewZealandMapGrid** projection has the following parameters:

- *Longitude of NZMG Origin*
- *Latitude of NZMG Origin*
- *False Easting*
- *False Northing*

OBLIQUE MERCATOR AZIMUTH

The Oblique Mercator projection is a cylindrical, conformal map projection. It is similar to the Mercator projection, except that the cylinder is wrapped around the ellipsoid so that it touches the surface along the great circle path chosen for the central line, instead of along the Earth's equator. Scale becomes infinite 90 degrees from the central line and is true along a chosen central line, along two straight lines parallel to the central line, or along a great circle at an oblique angle. The Oblique Mercator projection is used for geographic regions that are centered along lines that are neither meridians nor parallels, but that may be taken as great circle routes passing through the region, such as the Alaskan panhandle. In this variation of the Oblique Mercator projection, a point and an azimuth define the central line where the cylinder touches the ellipsoid.

The planar points determined by this projection may be left unrectified (often these are referred to as the u, v coordinates in published formula) or they may be rectified (often these are referred to as the x, y coordinates in published formula). Rectification consists of rotating the coordinates by a certain angle. This implementation of the Oblique Mercator projection allows for a flag to be set to determine if the points should be rectified, or not. By default, the points will be rectified. If an unrectified version of the projection is desired, the *Unrectified Flag* parameter should be set to 1.5In the case where the points are rectified, the angle of rotation may be one of three values. Most commonly, it may be a user-specified rotation, or a rotation such that the y-axis will be parallel to the meridian through the center of the projection (the angle used in this case is often referred to in published formula as alpha). Less commonly, it may be a rotation such that the y-axis will be parallel to the meridian through the natural origin of the projection (the angle used in this case is often referred to in published formula as gamma).

If the *Rotation Angle* parameter is a non-zero number, it will be used in the rectification. If the *Rotation Angle* is zero, the default behavior will be to rectify so that the y-axis will be parallel to the meridian through the center of the projection. If it is desired that the rectification cause the y-axis to be parallel to the meridian through the natural origin of the projection, the *Use Gamma Flag* parameter should be set to 1.

By default, the planer coordinates will be provided in terms of the natural origin of the projection. Alternately, they may be shifted based on the center of the projection. If it is desired that the coordinates be shifted, the **Center Flag** parameter should be set to 1. Note that this is only an option in the Oblique Mercator Azimuth projection, and is not currently supported in the Two Point case.

By default, the **Azimuth** parameter provided is assumed to be the angle at the center of the projection (alpha). However, there may be times when you want instead to specify the angle at the natural origin of the projection (gamma). Since each angle may be computed based on the other, either one can be specified when defined in the projection. If the **Azimuth Is Gamma** flag is set, it is assumed that the value passed in via the **Azimuth** parameter is the angle at the natural origin of the projection (gamma). Otherwise, it is assumed that the value passed in via the *Azimuth* parameter is the angle at the center of the projection (alpha).

The **ObliqueMercatorAzimuth** projection has the following parameters:

- *Longitude at the Center of the*
- *Latitude of the Origin of the Projection*
- *Azimuth of the Central Line*
- *Scale Factor at the Center of the Projection*
- *False Easting*
- *False Northing*
- *Projection Rotation Angle (Defaults to 0)*
- *Unrectified Flag (Defaults to 0)*
- *Use Gamma Flag (Defaults to 0)*
- *Center Flag (Defaults to 0)*
- *Azimuth is Gamma (Defaults to 0)*

OBLIQUE MERCATOR TWO POINTS

The Oblique Mercator projection is a cylindrical, conformal map projection. It is similar to the Mercator projection, except that the cylinder is wrapped around the ellipsoid so that it touches the surface along the great circle path chosen for the central line, instead of along the Earth's equator. Scale becomes infinite 90 degrees from the central line and is true along a chosen central line, along two straight lines parallel to the central line, or along a great circle at an oblique angle. The Oblique Mercator projection is used for geographic regions that are centered along lines that are neither meridians nor parallels, but that may be taken as great circle routes passing through the region, such as the Alaskan panhandle. In this variation of the Oblique Mercator projection, two points define the central line where the cylinder touches the ellipsoid.

The planar points determined by this projection may be left unrectified (often these are referred to as the u, v coordinates in published formula) or they may be rectified (often these are referred to as the x, y coordinates in published formula). Rectification consists of rotating the coordinates by a certain angle. This implementation of the Oblique Mercator projection allows for a flag to be set to determine if the points should be rectified, or not. By default, the points will be rectified. If an unrectified version of the projection is desired, the *Unrectified Flag* parameter should be set to 1.

In the case where the points are rectified, the angle of rotation may be one of three values. Most commonly, it may be a user-specified rotation, or a rotation such that the y-axis will be parallel to the meridian through the center of the projection (the angle used in this case is often referred to in published formula as alpha). Less commonly, it

may be a rotation such that the y-axis will be parallel to the meridian through the natural origin of the projection (the angle used in this case is often referred to in published formula as gamma). If the *Rotation Angle* parameter is a non-zero number, it will be used in the rectification. If the *Rotation Angle* is zero, the default behavior will be to rectify so that the y-axis will be parallel to the meridian through the center of the projection. If it is desired that the rectification cause the y-axis to be parallel to the meridian through the natural origin of the projection, the **Use Gamma Flag** parameter should be set to 1.

The **ObliqueMercatorTwoPoint** projection has the following parameters:

- *Latitude of the Origin of the Projection*
- *Latitude of the First Point*
- *Longitude of the First Point*
- *Latitude of the Second Point*
- *Longitude of the Second Point*
- *False Easting*
- *False Northing*
- *Rotation Angle (Defaults to 0)*
- *Unrectified Flag (Defaults to 0)*
- *Use Gamma Flag (Defaults to 0)*

ORTHOGRAPHIC

The Orthographic projection closely resembles a globe in appearance, since it is a perspective projection from infinite distance. Only one hemisphere can be shown at a time. This projection is used chiefly for pictorial views and is used only in spherical form.

When **Orthographic** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *Radius of the Sphere*
- *Longitude of the Center of the Projection*
- *False Northing and False Easting*
- *Latitude of the Center of the Projection*

NOTE: Only a spherical form of this projection is used. The radius of the sphere is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated. You are required to specify a geodetic datum when you use this projection as part of a coordinate system in order to perform geodetic datum shifts into other coordinate systems.

PERSPECTIVE CONIC

The Perspective Conic projection is produced by projecting the Earth perspectively from the center (or from some other point) onto a tangent or secant cone, along the standard parallels. The meridians are equally spaced straight lines converging at a common point representing one of the poles. The parallels are represented as unequally spaced concentric circular arcs centered on the pole of convergence of the meridians. The other pole may not be represented on the projection, though in some cases it may appear as a circular arc. Along the standard parallels scale is true and there is no distortion. Other conformal or equal-area conics demonstrate less rapid distortion in a north-south direction, however, and are preferred to the Perspective Conic.

The **PerspectiveConic** projection has the following parameters:

- *Longitude of the Center of the Projection*
- *Latitude of Northern Standard Parallel*
- *False Northing*
- *Latitude of Southern Standard Parallel*
- *False Easting*

POLAR STEREOGRAPHIC

The Polar Stereographic projection somewhat resembles other polar azimuthal projections, with straight radiating meridians and concentric circles for meridians. This projection is used for polar mapping within the Universal Polar Stereographic (UPS) coordinate system.

When **Polar Stereographic** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Latitude of the Center of the Projection*
- *Longitude of the Center of the Projection*
- *Scale Reduction Factor at the Center of the Projection*

POLYCONIC

The Polyconic projection is neither an equal-area nor a conformal projection. Scale is true along each parallel and along the central meridian. Parallels of latitude are arcs of non-concentric circles and the projection is free of distortion only along the central meridian. The Polyconic projection can be used to represent small areas on any part of the globe, preserving shapes, areas, distances, and azimuths in their true relation to the surface of the Earth. Polyconic projections over large areas usually result in serious errors and exaggeration of details.

When **Polyconic** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Latitude of the Center of the Projection*
- *Longitude of the Center of the Projection*

QUARTIC AUTHALIC

The Quartic Authalic projection is a pseudocylindrical, equal area projection that is used primarily for world maps. It was first presented by Karl Siemon in 1937, and then later presented independently by Oscar Sherman Adams in 1945. This projection serves as a basis for the McBryde-Thomas Flat Polar Quartic projection. The central meridian is depicted as a straight line 0.45 as long as the Equator. Other meridians are equally spaced curves, concave toward the central meridian. The parallels are straight parallel lines perpendicular to the central meridian. These are spaced farthest apart near the Equator, but gradually grow closer spaced when moving toward the poles. The poles are represented by points.
Distortion is significant near the outer meridians, at high latitudes, but is less than in the Sinusoidal projection. There is no distortion and scale is true along the Equator. Scale is constant along any given latitude. The **QuarticAuthalic** projection has the following parameters:

- *Longitude of Origin*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

ROBINSON

The Robinson projection provides a means of showing the entire Earth in an uninterrupted form. The Robinson projection is destined to replace the Van der Grinten projection as the premier projection used by the National Geographic Society.

When **Robinson** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Central Meridian*

SINUSOIDAL

The Sinusoidal projection is pseudocylindrical and equal-area. The central meridian is a straight line. All other meridians are shown as equally spaced sinusoidal curves. Parallels are equally spaced straight lines, parallel to each other. Poles are points. Scale is true along central meridian and all parallels. The Sinusoidal projection is used for maps of South America and Africa.

When **Sinusoidal** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Central Meridian*

SPACE OBLIQUE MERCATOR

The Space Oblique Mercator (SOM) projection is a modified cylindrical projection with the map surface defined by a satellite orbit. The SOM is an extremely complicated projection. We urge you to refer to *Map Projections a Working Manual* by Snyder for a detailed explanation. The SOM projection was designed especially for continuous mapping of satellite imagery. The ellipsoidal form with a non-circular satellite orbit is implemented within MAPublisher.

When **Space Oblique Mercator** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Central Meridian*
- *Semi-major Axis of the Satellite Orbit*
- *Eccentricity of the Satellite Orbit*
- *Longitude of Perigee relative to the Ascending Node*
- *Length of Time of the Earth's Rotation*
- *Time of Revolution of the Satellite*
- *Inclination of the Satellite Orbit*
- *Longitude of the Ascending Node*

STEREOGRAPHIC

The Stereographic projection is the only known true perspective projection of any kind that is also conformal. The central meridian and a particular parallel (if shown) are straight lines. All other meridians and parallels are shown as arcs of circles.

When **Stereographic** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Latitude of the Center of the Projection*
- *Longitude of the Center of the Projection*
- *Scale Reduction Factor at the Center of the Projection.*

STEREOGRAPHIC 70

Stereographic 70 is a derivation of the Stereographic projection for use in Romania.

When **Stereographic 70** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Latitude of the Center of the Projection*
- *Longitude of the Center of the Projection*
- *Scale Reduction Factor at the Center of the Projection.*

SWISS OBLIQUE MERCATOR

The Swiss Oblique Mercator projection is a particular case of an Oblique Mercator projection, which in turn differs from the Mercator and Transverse Mercator projections in that the central line with true scale is neither the equator (as in the Mercator), nor a meridian (as in the Transverse Mercator), and is chosen to suit the region to be mapped. In the Swiss Oblique Mercator this line has an azimuth of 90 degrees and contains the centre of the projection.

The **SwissObliqueMercator** projection has no parameters.

TILTED PERSPECTIVE

The Tilted Perspective projection represents a view of the Earth from space in which the view is from anywhere other than a point precisely facing the center of the Earth. This projection is therefore used to generate pictoral views of the Earth resembling those seen from space.

It is a modified azimuthal projection that is neither conformal nor equal area. The central meridian and a particular parallel (if shown) are straight lines. Other meridians and parallels are usually arcs of circles or ellipses, but some may be parabolas or hyperbolas. If the point of perspective is above the sphere, less than one hemisphere may be shown.
The **TiltedPerspective** projection has the following parameters:

- *Azimuth*
- *Tilt*
- *Longitude of Origin*
- *Latitude of Origin*
- *False Northing*
- *False Easting*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

TIMES

The Times projection is a pseudo-cylindrical projection that is neither equal area nor conformal. It was first presented by John Moir in 1965. It is used to generate the world maps in The Times Atlas of the World, produced by Collins Bartholomew. The central meridian and Equator are depicted as straight lines. All other meridians are equally spaced curves, concave toward the central meridian. The parallels are straight lines perpendicular to the central meridian, increasing in separation away from the Equator. Scale is correct along the two parallels at 45° N and S.

The **Times** projection has the following parameters:

- *Longitude of Origin*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

TRANSVERSE MERCATOR (GAUSS-KRUGER)

The Transverse Mercator projection is similar to the Mercator Projection, except that the axis of the projection cylinder is rotated 90 degrees from the polar axis. This projection does not have the straight meridians and straight parallels of the Mercator projection, except for the central meridian, the two meridians 90 degrees away, and the equator. Nor does the Transverse Mercator projection have the straight rhumb lines of the Mercator projection; rather, it is a conformal projection. Scale is true along the central meridian or along two straight lines equidistant from and parallel to the central meridian.

The Transverse Mercator projection is the projection used in the State Plane Coordinate System for states with predominant north-south extent. It is also the geometric basis for the UTM Coordinate System.

The term Gauss-Kruger, or simply Gauss, refers to coordinate systems in parts of the world, for example, Germany and South America, based on the Transverse Mercator projection.

When **Transverse Mercator** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Central Meridian*
- *Latitude of the Origin of the Projection*
- *Scale Reduction Factor at the Central Meridian*

TRANSVERSE MERCATOR EXTENDED

This is a variation of the standard Transverse Mercator projection that is provided for the definition of coordinate systems used in specific counties in the U.S. states of Minnesota and Wisconsin. Within a specific county in one of these states, the ellipsoid must be expanded by an additional amount to account for the average elevation within that county. In the case of a Wisconsin county, the ellipsoid must also be adjusted based on the average geoid height for that county. For Minnesota counties, the average geoid height should be set to zero.

The **TransverseMercatorExtended** projection has the following parameters:

- *Longitude of the Central Meridian*
- *Latitude of the Origin of the Projection*
- *Scale Reduction Factor at the Center of the Projection*
- *False Easting*
- *False Northing*
- *Average Elevation (Minnesota and Wisconsin)*
- *Average Geoid Height (Wisconsin only)*.

TRANSVERSE MERCATOR SNYDER

This projection is based on the description and formulae in John P. Snyder Map Projections-- A Working Manual (U.S. Geological Survey Professional Paper 1395), pp. 60-64. These formulas have been superseded by more precise versions. There are, however, some instances where users may want to use the older, less precise formulas (for example, if the results will be compared to old data).

The **TransverseMercatorSnyder** projection has the following parameters:

- *Longitude of the Central Meridian*
- *Latitude of the Origin of the Projection*
- *Scale Reduction Factor at the Center of the Projection*
- *False Easting*
- *False Northing*

TRANSVERSE MERCATOR SOUTH ORIENTED

This is a projection used in the southern hemisphere. It is identical to the standard Transverse Mercator, except that the false easting and northing are interpreted instead as a false westing and southing.

The **TransverseMercatorSouthOriented** projection has the following parameters:

- *Longitude of the Central Meridian*
- *Latitude of the Origin of the Projection*
- *Scale Reduction Factor at the Center of the Projection*
- *False Easting*
- *False Northing*

TRANSVERSE MERCATOR STATE PLANE 27

The State Plane Coordinate System (SPCS) is not a projection; rather it is a system for specifying positions of geodetic stations using plane rectangular coordinates. This coordinate system that divides all fifty states of the United States, Puerto Rico and the U.S. Virgin Islands into over 120 numbered sections, referred to as zones. Each zone has an assigned code number that defines the projection parameters for the region.

There are four possible projections for SPCS. The geometric direction of each state determines the projection utilized. For states that are longer in the east-west direction, the Lambert Conformal Conic is used. States that are longer in the north-south direction use the Transverse Mercator Projection. The panhandle of Alaska, which has the sole distinction of lying at an angle, garners the use of the Oblique Mercator Projection. Conversely, Guam uses a Polyconic projection.

The formulae for these calculations are based on Publication 62-4, *State Plane Coordinates by Automatic Data Processing*, U.S. Department of Commerce 1968. These projections should only be used for data that has been computed using this method. For all other state plane calculations use Exact Methods. The parameters for these coordinate systems are defined in Publication 62-4. For further information contact the U.S. Department of Commerce.

The **Mercator27** projection does not require any parameters.

TWO-POINT FIT

The Two-Point Fit Projection is used when a local grid needs to be converted to another coordinate system. From two known points (with both easting/northing and lat/long values for each point), the remainder of the grid values can be derived and used for coordinate conversion purposes.

When **Two-Point Fit** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing Northing and False Easting of the first point*
- *Northing and False Easting of the second point*
- *Latitude and Longitude of the first point*
- *Latitude and Longitude of the second point*

What happens is that MAPublisher takes two points (i.e. a line) from one coordinate system (lat/long for example) and THE SAME two points from a second coordinate system (e.g. local survey coordinates) and matches them. You must have TWO points that you know what the coordinates are in BOTH systems.

Example Situation:

For example: A surveyor ties into two benchmarks (BM1 = 45N, 84W and BM2 = 45 00 01N, 84W).
She starts at BM1 and calls it 10000/10000(Northing/Easting) and traverses to BM2 and gets some N/E value. You now have two points (BM1 and BM2) that have Lat/Long coordinates and Local coordinates. That is, you now have the endpoints and orientation of a common line in two coordinate systems. You need to define a new coordinate system using those two points as the references. Any scaling, rotation, etc. issues are taken care of because you have just linked two points (i.e. defined a line length and orientation in space) that are common to both coordinate systems.

UNIVERSAL TRANSVERSE MERCATOR

The Universal Transverse Mercator (UTM) projection class is an extension of the Transverse Mercator projection class that allows all UTM zones in a given horizontal datum to be represented by a single Geodetic Datasource object.

The **UniversalTransverseMercator** projection has the following parameters, all of which are optional:

- *Current zone number*
- *Currently in northern hemisphere (is_north)*
- *Automatically set zone (autoset)*

The actual Transverse Mercator parameter values to use when converting between geodetic and projected coordinate are determined from the values of the zone and is_north parameters. If the autoset parameter is set to 1, then the zone and is_north parameters will be automatically recomputed each time a conversion from geodetic coordinates is performed, based on the input geodetic coordinates. Conversions from projected coordinates always use the UTM projection currently specified by the parameters.

NOTE: In MAPublisher, Military Grid Reference System (MGRS) and U.S. National Grid (USNG) coordinate systems are defined with a UTM projection and a point style with the appropriate string format option.

V AND H

V and H Projection for lat and long transform to the V[ertical] and H[orizontal] coordinates used for wired telephone (AT&T). Created by Jay K. Donald of AT&T in 1957 to simplify the calculation of distance between telephone rate centers. The system is based on Donald Elliptic Projection. It is a two-point equidistant projection for the continental United States and Canada. It uses units of the square root of one-tenth of a mile.

The **V and H** projection has no parameters.

VAN DER GRINTEN

This projection is neither conformal nor equal-area, but shows the globe enclosed in a circle. This projection is exclusively used for world maps. The central meridian and Equator are straight lines, with scale true along the equator only.

When **Van der Grinten** is selected in the **[Edit Geodetic Datasource]** dialog box you will need to enter the following parameters:

- *False Northing and False Easting*
- *Longitude of the Center of the Projection*
- *Radius of the Sphere*

VAN DER GRINTEN IV

This projection is neither conformal nor equal-area, but shows the globe enclosed in an apple shape. This projection is used rarely for world maps. The central meridian and Equator are straight lines, with scale true along the equator only.

The **Van der Grinten IV** projection has the following parameters:

- *False Northing*
- *Longitude of the Center of the Projection*
- *False Easting*
- *Radius of the Sphere*

VERTICAL PERSPECTIVE

The Vertical Perspective projection represents a view of the Earth from space in which the view is from a point precisely facing the center of the Earth. This projection is therefore used to generate pictoral views of the Earth resembling those seen from space. It is an azimuthal projection that is neither conformal nor equal area. The central meridian and a particular parallel (if shown) are straight lines. Other meridians and parallels are usually arcs of circles or ellipses, but some may be parabolas or hyperbolas. If the point of perspective is above the sphere, less than one hemisphere may be shown.

The **VerticalPerspective** projection has the following parameters:

- *Longitude of the Center of the Projection*
- *Latitude of the Center of the Projection*
- *False Easting*
- *False Northing*
- *Height*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

WINKEL I

The Winkel I projection is a pseudocylindrical projection that is neither conformal nor equal area. Oswald Winkel developed it in 1914 as the average of the Sinusoidal and Equidistant Cylindrical (Equirectangular) projections. It is used primarily for world maps. The central meridian is a straight line, while other meridians are equally spaced sinusoidal curves concave toward the central meridian. The parallels are equally spaced straight parallel lines perpendicular to the central meridian. The poles are represented by lines. If the latitude of true scale is chosen to be 50°28′, the total area scale will be correct, though local area scales will vary.

The **WinkelI** projection has the following parameters:

- *Longitude of the Center of the Projection*
- *Latitude of True Scale*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

WINKEL II

The Winkel II projection is a pseudocylindrical projection that is neither conformal nor equal area. Oswald Winkel developed it in 1918 as the average of the Mollweide and Equidistant Cylindrical (Equirectangular) projections. It is used primarily for world maps.

The central meridian is a straight line, while other meridians are equally spaced curves concave toward the central meridian. The parallels are equally spaced straight parallel lines perpendicular to the central meridian. The poles are represented by lines. The length of the poles and of the central meridian will depend on the choice of the latitude of true scale. Scale is true along the north and south latitudes specified by the latitude of true scale, but the projection is generally distorted.

The **Winkel II** projection has the following parameters:

- *Longitude of the Center of the Projection*
- *Latitude of True Scale*
- *False Easting*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

WINKEL TRIPEL

The Winkel Tripel projection is a modified azimuthal projection that is neither conformal nor equal area. Oswald Winkel developed it in 1921 as the average of the Aitoff and Equidistant Cylindrical (Equirectangular) projections. It is used primarily for whole world maps.

In this projection, the central meridian is a straight line. Other meridians are equally spaced along the Equator and are concave toward the central meridian. The Equator and the poles are straight lines, while all other parallels are curves, equally spaced along the central meridian and concave toward the nearest pole. Scale is true along the central meridian and constant along the Equator. Distortion is moderate, except near the outer meridians in the polar regions.

The **Winkel Tripel** projection has the following parameters:

- *Longitude of the Center of the Projection*
- *False Easting*
- *Standard Parallel*
- *False Northing*

NOTE: Only a spherical form of this projection is used. The semi-major axis of the ellipsoid (sphere) is used for forward and inverse projection from grid to geodetic coordinates within the system wherein this projection is incorporated.

Datum Shifts

7 PARAMETER METHODS

There are two types of seven parameter transformation available. The difference between the two is the rotation sense (which direction the rotations take place in.) This method is sometimes referred to as the Bursa-Wolfe method. The seven parameter methods incorporate three geocentric translations, three geocentric rotations, and a scale correction factor. To change parameters from one rotation sense to the other, you must simply reverse the sign of the rotation values.

The parameters to define a seven parameter transformation are:

Parameter	Often Noted as
X Translation	dX
Y Translation	dY
Z Translation	dZ
Scale	k
X Rotation	rX
Y Rotation	rY
Z Rotation	rZ
Scale	k

NOTE: To properly define a seven parameter translation, you MUST know which rotation sense is used for your transformation parameters.

The two types of rotation sense for seven parameter transformations are:

Position Vector Rotation (PVR)
The rotations are defined as positive clockwise, as may be imagined to be seen by an observer at the origin of the coordinate frame, looking in the positive direction of the axis about which the rotation is taking place.

Coordinate Frame Rotation (CFR)
Rotation is positive counter-clockwise, as may be imagined to be seen by an observer at the origin of the coordinate frame, looking in the positive direction of the axis about which the rotation is taking place.

CANADIAN NATIONAL TRANSFORMATION VERSION 2 (NTV2)

MAPublisher supports the definition of a geodetic datum based on the Canadian National Transformation Version 2.0 directly. The Canadian National Transformation originally defined an accurate transformation from NAD27 to NAD83 for Canada, but the method has been adopted by Australia, New Zealand, Spain, and several other locations around the world. The shift values for a geographic area are stored in a single grid file, representing latitude and longitude shifts (named with the extension .gsb).

MAPublisher uses grid files in a format published and provided by the Canadian Government. While the definition of this method is supported, it does require additional files to implement new datum transformations using this method. Contact information is as follows:

Address: Natural Resources Canada
Geodetic Survey Division
Geomatics Canada
Room 440
615 Booth Street
Ottawa, Ontario
K1A 0E9

Phone: (613) 995-4410
FAX: (613) 995-3215
Email: information@geod.NRCan.gc.ca
Web: *www.geod.NRCan.gc.ca*

ED50 TO ED87 NORTH SEA

The ED50 to ED87 North Sea Transformation consists of 4th order reversible polynomial that is used to convert coordinates between the ED50 and ED87 datums. This formula was published in a 1991 note created by the Norwegian Mapping Authority (Statens Kartverk) entitled *Om Transformasjon mellom Geodetiske Datum i Norge*. The **ED50ToED87NorthSea** transformation method is hard-coded and does not require any parameters.

FOUR PARAMETER METHOD

Based on the Helmert family of transformations, a Four parameter transformation is similar to a Seven parameter transformation, except it does not include rotations.

Parameters needed to define a four parameter transformation are:

Parameter	Often Noted as
X Translation	dX
Y Translation	dY
Z Translation	dZ
Scale	k

GEOCENTRIC TRANSFORMATIONS

A three-parameter translation between two geocentric coordinate systems. This is a non-simplified Molodensky transformation. There are three steps that are performed by this transformation. First the input point is represented as a Cartesian point in three dimensions on the input datum. The coordinates of this point are then translated using the dx, dy, and dz parameters. Finally, the translated point is represented converted to a geodetic point on the output datum.

HARN

MAPublisher supports the definition of a geodetic datum based on a NGS High Accuracy Reference Network (HARN). The National Geodetic Survey is establishing HARNs within the U.S. on a state-by-state basis.

You can think of a HARN as a geodetic datum, most easily viewed as an enhanced NAD83 datum. HARNs are also known as NAD83/91 and High Precision Grid Networks (HPGN). The NGS HARN method is actually very similar to the NGS NADCON method. As with the NADCON method the shift values for a geographic area are stored in a set of grid files, one representing latitude shifts (named with the extension .las) and one representing longitude shifts (named with the extension .los). The major difference is that the HARN data files contain shifts from NAD83 to a HARN instead of NAD27 to NAD83. MAPublisher uses grid files in a format published and provided by the National Geodetic Survey. Questions about the availability of other HARN grid files (and the HARN systems in general) should be addressed to:

Address: NGS Information Services, NOAA, N/NGS12
National Geodetic Survey SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

Phone: (301) 713-3242
Web: *www.ngs.noaa.gov*

The current HARNs are already pre-defined within MAPublisher. As new HARNs are completed and made available, they will be added to avenza.xml.

LONGITUDE ROTATION

The Longitude Rotation datum shift method is a transformation on a two-dimensional or three-dimensional geographic coordinate system that changes the longitude values by a rotation value and leaves the latitude and elevation values unchanged.

The one parameter to define a longitude rotation is the angle of rotation.

MOLODENSKY TRANSFORMATIONS

The Molodensky transformation method shifts coordinate values between local and geocentric datums using three linear shift parameters. It provides a general solution with limited accuracy. The Molodensky method provides a transformation that is accurate to within 5-10 metres. For a detailed discussion of the Molodensky algorithms and parameters for a variety of local geodetic datums, please refer to: Defense Mapping Agency, Technical Report TR 8350.2, 1991 *Department of Defense World Geodetic System 1984: Its Definition and Relationships with Local Geodetic Systems.* The Molodensky method can be defined for local geodetic datums worldwide.

MRE (MULTIPLE REGRESSION EQUATIONS)

The DMA Multiple Regression Equations transformation method shifts coordinate values between geodetic datums. It can be defined for local geodetic datums worldwide. The DMA Multiple Regression Equations method uses Doppler-derived parameters and provides a general solution with limited accuracy. It provides a transformation that is accurate to within 3-10 metres.

For a detailed discussion of the DMA Multiple Regression Equations algorithms and parameters for a variety of local geodetic datums, please refer to Defense Mapping Agency Technical Report TR 8350.2, 1991*Department of Defense World Geodetic System 1984: Its Definition and Relationships with Local Geodetic Systems*.

The main advantage of the DMA Multiple Regression Equations method lies in the modeling of distortions for datums that cover continental-sized land areas. This achieves a better fit in geodetic applications than the Molodensky method.

NOTE: The DMA Multiple Regression Equations method is an application of the theory of least squares. The coefficients for the mathematical regression equations are determined by fitting a polynomial to predicted shifts in a local area. If the DMA Multiple Regression Equations method is applied outside of the local area for which the coefficients of the equations are determined, the results may be unpredictable.

NADCON METHOD

The NGS NADCON method transforms coordinate values between the North American Datum of 1927 (NAD 27) and the North American Datum of 1983 (NAD 83). The NGS NADCON method provides a transformation that is accurate to within 0.15-0.5 metres. (Please refer to NOAA Technical Memorandum NOS NGS-50 *NADCON - The Application of Minimum Curvature-Derived Surfaces in the Transformation of Positional Data from the North American Datum of 1927 to the North American Datum of 1983*).

The NGS NADCON method applies a simple interpolation algorithm using a gridded set of standard datum shifts as parameters. The shift values for a geographic area are stored in a set of grid files, one representing latitude shifts (named with the extension .las) and one representing longitude shifts (named with the extension .los). MAPublisher uses grid files in a format published and provided by the National Geodetic Survey. Questions about the availability of other NADCON grid files (and the NGS NADCON method in general) should be addressed to:

Address: National Geodetic Survey
11400 Rockville Pike
Rockville, MD 02852

Phone: (301) 713-3242
Web: *www.ngs.noaa.gov*

NTF TO RGF93

Converts coordinates from NTF (Nouvelle Triangulation de la France) to RGF93 (Réseau Géodesique Français) using a grid file defined by IGN (*Institut Géographique National*, the French National Geographical Institute). The default grid file assumes a Greenwich prime meridian.

ORDNANCE SURVEY GRID (OSTN 02)

To cope with the distortions in the OSGB36 TRF, different transformations are needed in different parts of the country. For this reason, the national standard datum transformation between OSGB36 and ETRS89 is not a simple Helmert datum transformation. Instead, Ordnance Survey has developed a rubber-sheet type transformation which works with a transformation grid expressed in easting and northing coordinates. The grids of northing and easting shifts between ETRS89 and OSGB36 cover Britain at a resolution of one kilometre. From these grids a northing and

easting shift for each point to be transformed is obtained by a bi-linear interpolation.

The National Grid Transformation copes not only with the change of datum between the two coordinate systems, but also with the TRF distortions in the OSGB36 triangulation network, which make a simple datum transformation of the Helmert type limited to applications at 5m and larger accuracy levels. This transformation removes the need to estimate local Helmert transformations between ETRS89 and OSGB36 for particular locations.

Because the National Grid Transformation works with easting and northing coordinates, other ETRS89 coordinate types (3-D Cartesian or latitude and longitude) must first be converted to eastings and northings. This is done using the same map projection as is used for the National Grid (see section 7 below), except that the GRS80 ellipsoid rather than the Airy ellipsoid is used. After the transformation, the resulting National Grid eastings and northings can be converted back to latitude and longitude (this time using the Airy ellipsoid) if required.

POLYNOMIAL

The Polynomial datum shift methods uses a collection of parameters which define a high order mathematical function for transforming between two horizontal datums. These equations are usually created by local and regional geodetic authorities. They generally provide high accuracy transformations, but are limited to specific areas of use. In many cases the accuracy of these transformations is around one metre.

For a detailed description of generalized polynomial datum transformations, please refer to the OGP guidance notes. These are freely available from *www.epsg.org*.

NOTE: Polynomial datum shifts are generally computed for specific areas of use. Since the derivations of the formula are based on a limited number of reference points, using the transformation for data outside of the pre-determined envelopes may cause unreliable results.

SIX PARAMETER METHOD

Based on the Helmert family of transformations, the six parameter transformation is very similar to a seven parameter transformation, except it does not contain a scale parameter.

The Six parameters needed, are:

Parameter	Often Noted as
X Translation	dX
Y Translation	dY
Z Translation	dZ
Scale	k
X Rotation	rX
Y Rotation	rY
Z Rotation	rZ

TEN PARAMETER MOLODENSKY-BADEKAS METHOD

The Molodensky-Badekas 10 parameter transformation method allows for very high accuracy transformation of coordinates between datums over large areas. For a detailed reference on Molodensky-Badekas coordinate transformations, refer to the EPSG Surveying and Positioning Guidance Note Number 7, part 2: *www.epsg.org/guides/G7-2.html*.

Parameters needed to define a 10 parameter transformation are:

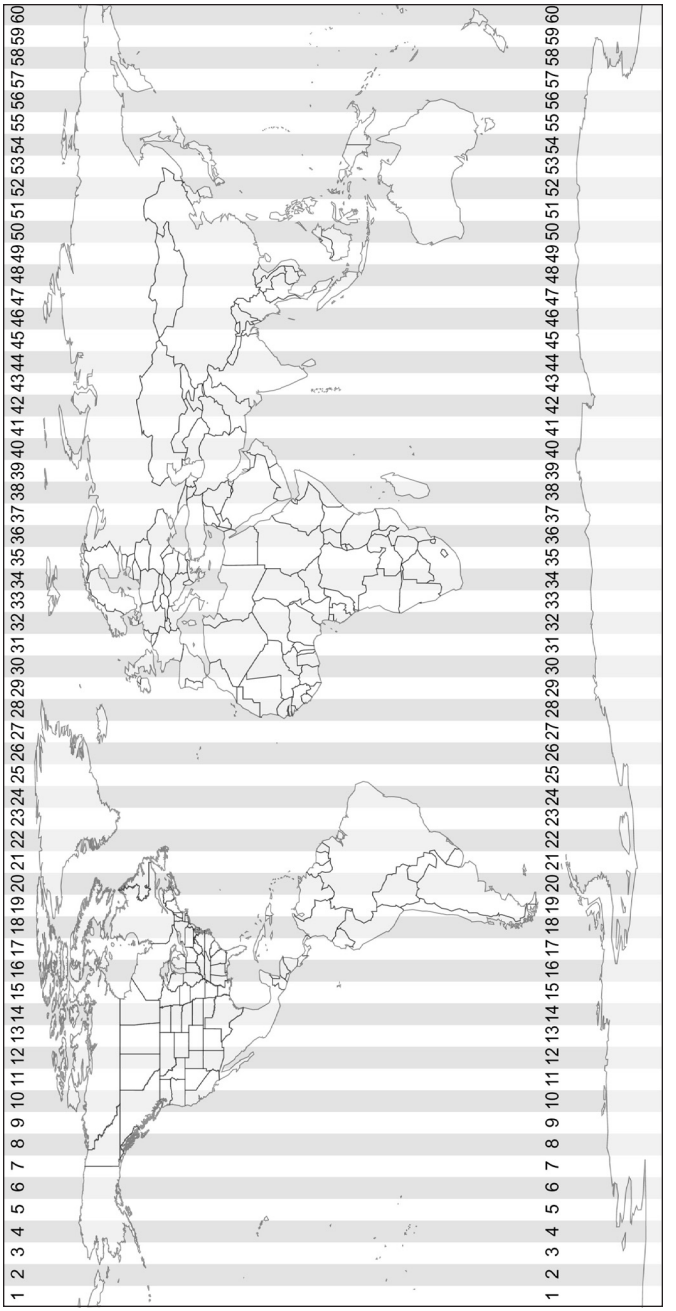
Parameter	Often Noted as
X Translation	dX
Y Translation	dY
Z Translation	dZ
Scale	k
X Rotation	rX
Y Rotation	rY
Z Rotation	rZ
Scale	k
X Ordinal	X
Y Ordinal	Y
Z Ordinal	Z

TOKYO TO JGD2000

Converts coordinates from the Tokyo datum to the JGD 2000 (Japan Geodetic Datum of 2000) using a grid file defined by GSI (Japanese Geographical Survey Institute).

UTM Map Zones

UTM Zone	Central Meridian	Longitude Range
1	177W	180W-174W
2	171W	174W-168W
3	165W	168W-162W
4	159W	162W-156W
5	153W	156W-150W
6	147W	150W-144W
7	141W	144W-138W
8	135W	138W-132W
9	129W	132W-126W
10	123W	126W-120W
11	117W	120W-114W
12	111W	114W-108W
13	105W	108W-102W
14	99W	102W-96W
15	93W	96W-90W
16	87W	90W-84W
17	81W	84W-78W
18	75W	78W-72W
19	69W	72W-66W
20	63W	66W-60W
21	57W	60W-54W
22	51W	54W-48W
23	45W	48W-42W
24	39W	42W-36W
25	33W	36W-30W
26	27W	30W-24W
27	21W	24W-18W
28	15W	18W-12W
29	9W	12W-6W
30	3W	6W-0
31	3E	0-6E
32	9E	6E-12E
33	15E	12E-18E
34	21E	18E-24E
35	27E	24E-30E
36	33E	30E-36E
37	39E	36E-42E
38	45E	42E-48E
39	51E	48E-54E
40	57E	54E-60E
41	63E	60E-66E
42	69E	66E-72E
43	75E	72E-78E
44	81E	78E-84E
45	87E	84E-90E
46	93E	90E-96E
47	99E	96E-102E
48	105E	102E-108E
49	111E	108E-114E
50	117E	114E-120E
51	123E	120E-126E
52	129E	126E-132E
53	135E	132E-138E
54	141E	138E-144E
55	147E	144E-150E
56	153E	150E-156E
57	159E	156E-162E
58	165E	162E-168E
59	171E	168E-174E
60	177E	174E-180E



Appendix 3: MAPublisher 8 How To's For Legacy Users

Legend Functionality in MAP Stylesheets

A number of functions have been redesigned in MAPublisher 8. Users of MAPublisher 6 or earlier should consult the following pages for information on how to perform common legacy MAPublisher tasks in MAPublisher 8.

BUILDING COLOUR RAMPS TO CREATE STYLES

You can enhance the look of your maps by using colour ramps, rather than random colours, for your area and line styles. A possible use for this would be in the creation of relief maps.

1. Determine the number of new graduated styles you wish to create.
2. Create two rectangles with the Rectangle Tool aligned vertically, one at the top of the page, the other at the base.
3. Colour the first (top) and last (bottom) elements with two end colours for the ramp.
4. Choose *Object* > *Blend* > *Blend Options*.
5. Choose *Specified Steps* from the list. Enter the value you determined in the first step minus two. Click OK.
6. Select the two rectangles. Choose *Object* > *Blend* > *Make*. The legend elements will be blended between the two end colours.
7. Choose *Object* > *Expand,* then choose *Object* > *Ungroup.* This ungroups the art so that the new styles can be added to the Graphic Styles panel and be used in the MAP Stylesheets.

ASSIGNING INCREMENTAL VALUES TO STYLES

It is very straightforward to assign styles to values for stylesheets based on *Equal to* expressions. The following examples can be used as a basis for new stylesheets, providing the functionality which was previously available in the *Unique Occurrences* option in *Auto Assign Legend Info.*

Example 1 (Rule 1 assigned first listed value and first style):

1. Create the first *Equal to* rule, using the first listed style, and an expression based on the first listed value in a specified attribute column, i.e. *Style A* assigned to *Column X = "Value 1"*.
2. Click the *Add* button. The second rule will be automatically assigned an incremental expression, i.e. *Style B* assigned to *Column X = "Value 2"*.
3. Keep clicking the *Add* button until all the values or styles have been used.

Example 2 (Rule 1 assigned first listed value and third style):

1. Create the first *Equal to* rule, using the first listed style, and an expression based on the third listed value in a specified attribute column, i.e. *Style C* assigned to *Column X ="Value 1"*.
2. Click the *Add* button. The second rule will be automatically assigned the first unused style, i.e. *Style A* assigned to *Column X = "Value 2"*.
3. Keep clicking the *Add* button. Assignments will be incremental, but will not include the third style again, i.e. *Style B* assigned to *Column X ="Value 3"*; *Style D* assigned to *Column X = "Value 4"*; etc

CREATING STYLE RULES BASED ON MULTIBLE ATTRIBUTE COLUMNS

Assign Legend Info previously provided options to assign legend criteria to legend elements based on values in multiple attribute columns. This functionality can now be achieved using Advanced expressions in the MAP Stylesheet Editor. Choose the **Advanced** option to compose advanced expressions.

The following are some examples of multi-column expressions in a world countries stylesheet *(using a string type column named CONTINENT and an integer type column named POPULATION).*

CONTINENT="Africa" AND POPULATION<1000000
Result: only African countries with populations less than one million are assigned the selected style.

CONTINENT="Africa" OR POPULATION<1000000
Result: all African countries and all countries with populations less than one million are assigned the selected style.

CONTAINS(CONTINENT,"America" AND POPULATION>1000000
Result: only countries in North and South America with populations more than one million are assigned the selected style.

CONTINENT="Europe" AND POPULATION>1000000 OR CONTINENT="Asia" AND POPULATION>10000000
Result: countries in Europe with populations more than one million and countries in Asia with populations more than ten million are assigned the selected style.

NUMBER OF UNIQUE ATTRIBUTES

Unique values are displayed in the Simple expression builder (see page 76).

Note the default maximum number of values which can be listed is set to 250. To increase the number of values listed in the MAP Stylesheet Editor value drop-down lists, please complete the following:

- Quit Adobe Illustrator
- Open your Adobe Illustrator preferences file in a text editor. *The default location and name of the preferences file is:*

Illustrator CS2 and CS3:
Windows XP: *Documents and Settings\[user name]\Application Data\Adobe\Adobe Illustrator CSXX Settings\AIPrefs*
Windows Vista: *Users\[user name]\AppData\Roaming\Adobe\Adobe Illustrator CSXX Settings\AIPrefs*
Mac OS X: *Users/[user name]/Library/Preferences/Adobe Illustrator CSXX Settings/Adobe Illustrator Prefs*

Illustrator CS4:
Windows XP: *Documents and Settings\[user name]\Application Data\Adobe\Adobe Illustrator CS4 Settings\en_US\AIPrefs*
Windows Vista: *Users\[user name]\AppData\Roaming\Adobe\Adobe Illustrator CS4 Settings\en_US\AIPrefs*
Mac OS X: *Users/[user name]/Library/Preferences/Adobe Illustrator CS4 Settings/en_US/Adobe Illustrator Prefs*

- Search for the text *MaxValuesPref*
- Edit the listed value from 250 to the required value
- Save the Adobe Illustrator preferences file
- Re-open Adobe Illustrator

Grid and Scalebar Operations

EDITING CUSTOM ART

Manually editing type (position, font, colour, etc) is not possible on Grids and Scale Bars in their default grouped state. Manual editing is possible but objects must be first expanded (choose *Object* > *Expand*). Note that this will negate any opportunity to subsequently edit the art using MAPublisher editing tools.

If you require a different design to be used for your Grid or Scale Bar, or wish to change any parameter without generating a new version, simply select the Grid or Scale Bar and choose *Object* > *Edit Grid* or *Scale Bar*. This will re-open the *Grids and Graticules* or *Scale Bar* dialog box with the current parameters of the object for subsequent editing. Editing the style of text (text colour, font, alignment, etc) used in the Grid or Scale Bar can be achieved by modifying the properties of the style in the *Character Styles* panel.

Use the bounding box of the generated grid or scale bar (choose *View* > *Show Bounding Box*) to resize. Resizing scale bars horizontally will add or remove intervals from the bar(s). Resizing scale bars vertically will adjust the width of the bar(s). Resizing grids horizontally or vertically will add or remove component cells in the grid.

EXPORTING GRIDS

To export a grid you must first expand the object (choose *Object* > *Expand*), then move it to an *Area* layer. Alternatively expand your grid, move the legend layer to the *[Non-MAP layers]* category, then move it back into the MAP View specifying the feature type as Area.

MISSING DATA IN GRIDS ON PROJECTED MAP VIEWS

Certain projections may cause incomplete grids and graticules to be drawn. Such issues may occur if the MAP View is in a polar projection or the extents of the data cross the 180 degree west/east meridian.

If the generation of a grid/graticule causes blank or incomplete results, the following workflow should be used:

1. Reproject the MAP View to a standard Lat/Long projection (e.g. NAD27 Lat/Long, Degrees).
2. Generate your grid or graticules on this MAP View.
3. Expand the object (choose *Object* > *Expand*).
4. Create a new Area layer in the MAP View. Drag the expanded grid to this new layer.
5. Reproject the MAP View back to the original projection.

Copy and Paste

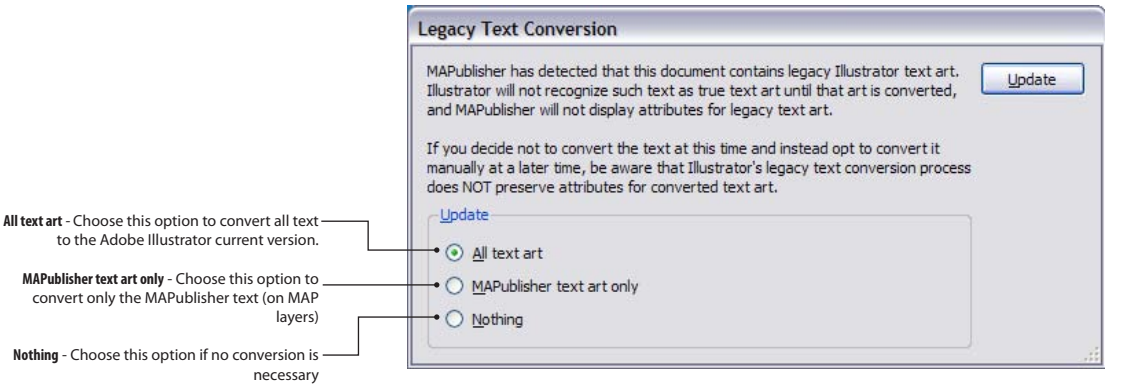
The MAP Copy/Paste function has been removed. You can now achieve the same functionality via Adobe Illustrator native Copy/Paste tools.

1. Use *Edit* > *Copy* or *Edit* > *Cut* to copy art.
2. Deselect the art.
3. Select the destination layer in the Layers panel
4. Use *Edit* > *Paste in Front* or *Edit* > *Paste in Back* to paste the art into the new layer at its previous location.

- When pasting to layers which already contain an attribute structure, the destination layer must have an attribute schema which matches the source layer.
- When pasting to layers which contain no attribute structure, the destination layer will be assigned the same attribute schema as the source layer.
- The destination layer can be contained in any MAP View as required.
- The destination layer must be of a matching feature type as the source layer.
- Pasted data will always maintain its attributes. If you paste into a non-map layer, drag this layer into a MAP View, then recreate the schema, attributes will be populated appropriately.

Legacy Text Conversion

Opening legacy files, you may be prompted to update text (legacy text conversion).
Only text objects that are associated to attributes are required to be updated. For other text with no attributes, you do not necessarily need to update.


Legacy Text Conversion
MAPublisher has detected that this document contains legacy Illustrator text art. Illustrator will not recognize such text as true text art until that art is converted, and MAPublisher will not display attributes for legacy text art.
Update
If you decide not to convert the text at this time and instead opt to convert it manually at a later time, be aware that Illustrator's legacy text conversion process does NOT preserve attributes for converted text art.
Update
All text art
MAPublisher text art only
Nothing
All text art - Choose this option to convert all text to the Adobe Illustrator current version.
MAPublisher text art only - Choose this option to convert only the MAPublisher text (on MAP layers)
Nothing - Choose this option if no conversion is necessary

Appendix 4: Helpful Styles and Symbols Files

The following files may be found in the Helpful Styles & Symbols files folder on your MAPublisher 8 CD or with your MAPublisher 8 download.
Windows XP: *C:\Documents and Settings\All Users\Documents\Avenza\MAPublisher 8\Helpful Styles & Symbols*
Windows Vista: *C:\Users\Public\Public Documents\Avenza\MAPublisher 8\Helpful Styles & Symbols*
Mac OS X: *Applications/Avenza/MAPublisher 8/Helpful Styles & Symbols*

Helpful Styles & Symbols > QuickMap Styles

QuickMap styles are graphic styles and symbol libraries meant to allow users to quickly style their maps by the use of MAP Stylesheets. To ease the process, areas are classified in land and water styles, lines are classified in borders, contours, roads, rails and rivers styles.

QuickMap Styles - Area.ai Categorized graphic style library , for use in Area Stylesheets.
QuickMap Styles - Line.ai Categorized graphic style library, for use in Line Stylesheets.
QuickMap Styles - Point.ai Symbol library with common map symbols, for use in Point Stylesheets.

Helpful Styles & Symbols > S-57 Symbolization

The S-57 Symbolization folder contains nautical graphic styles and symbols libraries inspired from the International Hydrographic Office M-4 publication (*Regulations of the IHO for international (INT) charts and charts specifications of the IHO*). Graphic styles and symbol names are mostly based on the S-57 naming conventions. The folder also contains templates with a series of MAPublisher Stylesheets linking S-57 imported features to appropriate nautical symbols and graphic styles. The basic template allow users to quickly apply styles to the imported data. The advanced template is more detailed to help users learn the format and make use of the data.

Nautical_Graphic_Styles.ai	Graphic style libraries for use with S-57 data.
Nautical_Symbols.ai	Symbols library for use with S-57 data (main symbols).
S57_Advanced_Template.ait	Adobe Illustrator template with detailed MAP Stylesheets for use with S-57 data.
S57_Basic_Template.ait	Adobe Illustrator template with simplified MAP Stylesheets for use with S-57data.
US5FL12M	Sample ENC file in S-57 format (chart of Tampa Bay, courtesy of NOAA®).

Use of the S-57 templates:

- To create a new document, choose *File* > *New from Template*. Select **S-57_Advanced_Template.ait**.
- Import a S-57 file (for example, use the sample file).
- In the **MAP Stylesheets** panel, move the layers from [No MAP Stylesheet] to its corresponding stylesheet, when available:
    - → *Advance template:* the corresponding stylesheet has the same name as the layer, but not all layers have a stylesheet (therefore stay under [No MAP Stylesheet]).
    - → *Basic template:* all layers have a stylesheet, with the same name as the layer or, if not, the name "others". The letters A, L and P have be added to the names to sort the stylesheets per feature type (Area, Line or Point).

NOTE: This representation is non-exhaustive and meant to assist users with limited knowledge of the S-57 format to interpret the data contents more easily. The created map must not be used for navigation, unless further processing is supervised by a trained hydrographer.

Helpful Styles & Symbols > Graphic Styles

This folder contains five graphic style libraries with various useful styles for areas and lines.

MAP_AreaStyles.ai	A custom library of styles, for use in Area Stylesheets.
MAP_LineStyles.ai	A custom library of style, for use in Line Stylesheets.
DGN_LineStyles.ai	A library of MicroStation DGN line styles 1-7, for use in Line Stylesheets.
MIF_AreaStyles.ai	A library of MapInfo MIF/MID area styles 1-71, for use in Area Stylesheets.
MIF_LineStyles.ai	A library of MapInfo MIF/MID line styles 1-77, for use in Line Stylesheets.

Helpful Styles & Symbols > Symbols

This folder contains eight symbols libraries, categorized per topics.

Aeronautical symbols.ai	A library of aeronautical point symbols.
Bank Symbols.ai	A library of symbols for major world banks, for use in Point Stylesheets.
MAP Symbols.ai	A library of useful map symbols.
NorthArrows.ai	A library of north arrow symbols, for use in the *Create North Arrow* filter.
Parks Symbols.ai	A library of symbols composed from the US National Parks Service font library.
Subway Symbols.ai	A library of symbols from the major subway lines in the world.
Transit Symbols.ai	A library of symbols for the major transit systems of the world.
Weather Symbols.ai	A library of weather-related point symbols.

Appendix 5: Glossary

A

Accuracy
The closeness of results of observations, computations or estimates to the true values or the values accepted as being true. Accuracy relates to the exactness of the result, and is distinguished from precision, which relates to the exactness of the operation by which the result is obtained.

AGI
Association for Geographic Information.

Algorithm
A set of rules for solving a problem.

ASCII
American Standard Code for Information Interchange, a widely used industry standard code for exchanging alphanumeric codes in terms of bit-signatures.

ANSI
American National Standards Institute, an association formed by the American Government and industry to produce and disseminate widely used industrial standards.

Analog / Analogue
A continuously varying electronic signal. Also refers to traditional paper mapping products and aerial photographs.

Annotation
The explanatory or descriptive alphanumeric text or labels on a map (or artwork), such as street or place names.

Application
A set of computer programs designed for a specific task.

ESRI Interchange File
File format with the extension .e00 for ArcInfo Interchange E00 files exported from ArcInfo.

Area
A bounded continuous two-dimensional object, which may or may not include its boundary. It is usually defined in terms of an external polygon or in terms of a set of grid cells. A fundamental unit of geographical information. See polygon.

Aspect
Individual azimuthal map projections are divided into three aspects: the polar aspect which is tangent at the pole, the equatorial aspect which is tangent at the Equator, and the oblique aspect which is tangent anywhere else. (The word aspect has replaced the word case in modern cartographic literature).

Attribute
Non-graphic alphanumeric textual information associated with a point, line, or area element in a GIS data set; tabular data associated with geographic features.

Azimuth
The angle measured in degrees between a base line radiating from a center point and another line radiating from the same point. Normally, the base line points north, and degrees are measured clockwise from the base line.

B

Base data
Fundamental cartographic information (e.g. coastlines, political boundaries) in relation to which additional data of a more specialized nature may be compiled or overlaid.

Bezier Curve
A Bezier curve consists of two anchor points connected by a curved segment, with at least one direction point and direction line attached to each anchor point.

Binary
A number system of base 2. Numbers are represented simply as a series of 0's or 1's in contrast to base 10 number systems that represent numbers using the characters 0-9. For example, the base 10 number 65535 translates to the base 2 number 1111111111111111. Binary numbers are the fundamental basis of computing.

Bitmap
A grid of small squares, cells or pixels stored in memory and used to generate an image.

Boolean
There are two types of values: true and false. True/false or yes/no usually represent these.

C

CAD(D)
Computer-Aided Design (and Drafting).

Cadastre
A public register or survey that defines or re-establishes boundaries of public and/or private land for purposes of ownership and taxation.

Cartogram
An abstracted or simplified map for displaying quantitative data for which the base is normally not true to scale.

Cartography
The organization and communication of geographically related information in either graphic or digital form. It can include all stages from data acquisition to presentation and use.

CAST
Centre for Advanced Spatial Technologies at the University of Arkansas.

Cell
The basic element of spatial information in a raster image.

Character encoding
A character encoding consists of a codec that pairs a sequence of characters from a given set with something else, such as a sequence of natural numbers, octets or electrical pulses, in order to facilitate the storage of text.

Choropleth map
A systematic representation in which colour or shading is applied to areas bounded by statistical or administrative limits.

Clipping
A graphic process of cutting lines and symbols off the edge of a display area.

Colour Ramp
A graduated range of colours between two extreme colour selections.

Conformal
A map projection is conformal when at any point the scale is the same in every direction. Therefore, meridians and parallels intersect at right angles and the shapes of very small areas and angles with very short sides are preserved. The size of most areas, however, is distorted.

Contour
A line connecting points of equal elevation.

Coordinate system
A graticule, or a Cartesian grid, in which points are located from two (or three) axes which intersect at a point.

Curvature
The amount of curve in a line as defined by a series of points.

D

Data model
An abstraction of the real world which incorporates only those properties, being relevant to the application at hand. The data model would normally define specific groups of entities, and their attributes and the relationships between these entities. A data model is independent of a computer system and its associated data structures.

Database
A collection of data organized according to a conceptual structure describing the characteristics of the data and the relationships among their corresponding entities.

Database management system (DBMS)
A set of computer programs for organizing the information in a database usually containing routines for data input, verification, storage, and retrieval.

Datum
Any numerical or geometrical value, surface, line, or point which may serve as a base or reference for other quantities.

DEM
Digital Elevation Model. A digital elevation model is a digital file consisting of terrain elevations for ground positions at regularly-spaced horizontal intervals. Digital elevation models are typically used to represent terrain relief. A DEM can be represented as a raster (a grid of squares) or as a triangular irregular network.

Demographics
Any information relative to people in an area of interest (statistics of birth, death, population, etc).

Developable surface
A developable surface is a simple geometric form capable of being flattened without stretching. Many map projections can then be grouped by a particular developable surface: cylinder, cone, or plane.

DGN
Native file format of MicroStation from Bentley Systems Inc.

Digital
The ability to represent data in discrete units or digits.

Digital Line Graph
USGS standard output file format. These files can be in either Optional (.opt, .do) or SDTS (.ddf) form.

Douglas-Peucker Line Simplification Algorithm
A method of simplifying line data by removing unnecessary vertices.

Drag
To hold down the mouse button while you move the mouse cursor on the screen.

Drag-and-drop
The action of clicking on objects, such as icons or files, and dragging them to a different location or space.

DTP
Desktop Publishing.

DWG
AutoCAD Drawing file.

DXF
AutoCAD Drawing Exchange Format.

E

Element
A fundamental geographical unit of information, such as a point, line, area, or pixel.

EPS
Encapsulated Post Script file format The EPS format is used to transfer PostScript language artwork between applications - also see PostScript.

Equal areas
A map projection is equal area if every part, as well as the whole, has the same area as the corresponding part on the Earth, at the same reduced scale. No flat map can be both equal area and conformal.

Equidistant
Equidistant maps show true distances only from the center of the projection or along a special set of lines. For example, an Azimuthal Equidistant map centered at Washington shows the correct distance between Washington and any other point on the projection. It shows the correct distance between Washington and San Diego and between Washington and Seattle. But, it does not show the correct distance between San Diego and Seattle. No flat map can be both equidistant and equal area.

F

FAQ
Frequently Asked Question.

Feature
A set of points, lines or polygons in a spatial database that represent a real-world entity. The terms feature and object are often used synonymously.

Feature code
A set of characters (alpha, alphanumeric or numeric) within the GIS, which uniquely identifies a feature class or group of features.

File
A collection of related information that can be accessed by an assigned name.

Filter
See Plug-in filters.

Folder
A storage area for files within the Macintosh OS, the equivalent of a DOS or UNIX directory.

Format
The way in which data is arranged for storage and for transmission between software and computers.

FTP
File Transfer Protocol.

G

Geographic features
Points, lines, and areas that are components of a map.

Geographic Imager
A suite of geospatial imaging tools for Adobe Photoshop.

Geographic Information System (GIS)
Any system designed for the capturing, storing, checking, integrating, analyzing and displaying of spatially referenced data about the Earth.

Georeference
To establish the relationship between page coordinates on a planar map and known real-world coordinates.

GeoTIFF
An industry-wide standard for specifying information in TIFF tags which was developed by several organizations within the GIS community. GeoTIFF files are raster images that contain georeferencing information as well as image information in a single file.

GIR
Geographic Information Retrieval.

GIS
Geographic Information Systems.

GPS
Global Positioning Systems.

Grain
The frequency of vertices or points forming a line.

Graticule
The spherical coordinate system based on lines of latitude and longitude.

Great Circle
A circle formed on the surface of a sphere by a plane that passes through the centre of the sphere. The Equator, each meridian, and each other full circumference of the Earth forms a great circle. The arc of a great circle shows the shortest distance between points on the surface of the Earth.

Grid
A set of regularly spaced sample points or an exact set of reference lines over the Earth's surface.

H

Header File
A file associated with an image that contains georeferencing information for the image. File extensions may be TFW or JPW (TIFF, JPG World Files), IRP (Image Report Files) or TAB (Table files).

Hydrography
The science of hydrography is the measurement and description of the waters on the surface of the Earth in the form of a chart and related publications.

Hypsography
Lines or points which depict the relief of the land or contours or spot elevations.

I

Icon
An image representing a software function or tool.

Image
A graphic representation or description of a scene, typically produced by an optical or electronic device. Examples include remotely sensed or satellite data, scanned data, and photographs.

Import sequence
The order of steps required to import data.

Integer
A number without a decimal. Integer values can be less than, equal to, or greater than zero.

Isoline
A line on a surface connecting points of equal value for any of the characteristics used in the representation of the surface.

J

Join Lines
A function in MAPublisher for joining a set of linear features based on a common value such as street name.

JPEG
Joint Photographic Experts Group is a lossy compression technique for raster file formats.

L

Label
Text used to identify a map feature.

LANDSAT
The generic name for a series of Earth resource scanning satellites launched by the United States of America.

Latitude
Angular distance, expressed in degrees and minutes, along a meridian north or south of the equator.

Lat/Long
Latitude/Longitude. Unprojected.

Layer
A designated level in artwork used for storing, organizing and editing graphic or mapping data.

Legend
The section of the map that explains the meaning of the symbols used to depict graphic or geographic elements.

Legend element
A legend key combined with its associated text.

Legend key
The graphic symbol used to illustrate attributes in a legend.

Longitude
The angular distance east or west from a standard meridian to another meridian on the Earth's surface, expressed in degrees and minutes.

Line
One of the basic geographical elements, defined by at least two pairs of X,Y coordinates, usually too narrow to be an area. See also arc, path and vector.

Listgeo
A free utility for examining GeoTIFF header information. It can be used to dump the contents of the GeoTIFF header in human readable form.

Linear scale
The relation between a distance on a map and the corresponding distance on the Earth. Scale varies from place to place on every map. The degree of variation depends on the projection used in making the map.

Lossless/Lossy
Lossless techniques compress image data without removing detai, lossy techniques compress images by removing detail.

M

Mac OS
Apple Macintosh operating system.

Map
A graphic representation of features of the Earth's surface or other geographically distributed phenomena.

Map anchor
The minimum X and Y coordinates of the data files.

Map coordinates
The X,Y representations of ellipsoidal Earth locations on a mapping plane.

Map extent
The geographic extent of a geographic data set specified by the minimum bounding rectangle.

MAP Layer
A MAPublisher term for an Adobe Illustrator layer containing georeferencing information.

Map projection
A map projection is a systematic representation of a round body such as the Earth on a flat (plane) surface. Each map projection has specific properties that make it useful for specific purposes. Also see Projection.

MAP Selection Filter
Expression criteria used for making a selection in MAPublisher documents.

MAP Stylesheet
A MAPublisher Stylesheet, containing styles based on attribute information.

MAP View
A MAPublisher term for a distinct configuration for the geospatial parameters (coordinate system, anchor, map scale and rotation) that are applied to a common grouping of data layers. A MAP Layer must reside within a MAP View.

Marquee
A dashed rectangle drawn with a selection tool used to select multiple objects.

Meridian
A line of longitude running vertically from the north pole to the south pole.

Metadata
Data about data typically including information such as currency, accuracy, extent and geographic projection assigned. Metadata is typically stored in data models or data dictionaries.

MIF/MID
The MapInfo Map Interchange Format. An ASCII file format pair exported from MapInfo GIS software. The .mif file contains the geometry information and the .mid file contains the attribute data

MrSID
MrSID is a file format developed by LizardTech that reduces the size of large, high-resolution images to a fraction of their original size while maintaining the original image quality and integrity.

N

NAD
North American Datum.

Network
Two or more interconnected computer systems for implementation of specific functions or a set of interconnected graphic lines defining some spatial features.

Node
The point or intersection at which areas or lines are joined; endpoints of an arc.

NSDI
National Spatial Data Infrastructure.

O

Orthophoto
A modified copy of a perspective photograph of the Earth's surface with distortions due to tilt and relief removed.

Overlay
A set of graphical data that can be superimposed on another set of graphical data through registration to a common coordinate system. The process of laying one set of digital spatial data over another for analysis purposes.

P

Page anchor
The location on the page where the map anchor is placed.

Page extent
Defines a rectangular portion of the graphics page to be displayed.

Page size
The size of the published document.

Parameters
Variable options or choices; boundaries of operations or of an object.

Path
A line/vector defined by a series of points (a string of X,Y coordinates).

PDF
Portable Document Format. Developed by Adobe, a PDF is a file type, which can be used to cross Macintosh, Windows, DOS, and UNIX platforms.

Pixel
The smallest unit of information in a grid cell map or raster image.

Pixel scale
The real world distance as represented by a single pixel in a georeferenced image

Plug-in filter
A module supplied separately from the Adobe Illustrator program, usually for creating special effects in artwork. The MAPublisher application plug-in filter is a module that enables the incorporation of GIS and mapping capabilities within the Adobe Illustrator graphics environment.

PMS
Pantone™ Matching System.

Point
A discrete location represented by a symbol or label, usually too small to be displayed as an area or line.

Polygon
Any area bounded by a straight or irregular closed line representing a map component or any other graphic feature.

Polyline
A line made up of a sequence of line segments.

Positional accuracy
The degree to which a position is measured or depicted, relative to its correct position as established by either other features or by other accurate processes.

Postscript
A page description language built into many desktop printers and virtually all high-end printing systems. See the Adobe Illustrator User Guide for more details.

PPC
Power PC (e.g. Macintosh PowerPC computer).

Precision
The number of digits used to express the fractional part of a number. The more digits, the more precision.

Projection
The representation on a plane surface of any part of the surface of the Earth. Also see Map Projection.

R

Raster
A method for the storage, processing and display of spatial data. Each given area is divided into rows and columns, which form a regular grid structure. Each cell must be rectangular in shape, although not necessarily square. Each cell within this matrix contains an attribute value as well as location coordinates. The spatial location of each cell is implicitly contained within the ordering of the matrix, unlike a vector structure which stores topology explicitly. Areas containing the same attribute value are recognized as such, however, raster structures cannot identify the boundaries of such areas as polygons. Also raster structures may lead to increased storage in certain situations, since they store each cell in the matrix regardless of whether it is a feature or simply empty space.

Record
A set of attributes relating to any entity; a set of related, contiguous data.

Redundancy
The duplication of data in a database.

Remote sensing
The technique of obtaining data about the environment and the surface of the Earth from a distance, for example, from aircraft or satellite.

Render
The process of generating an image by means of a computer program.

Resolution
The number of dots per inch displayed on screen or printed to an output device.

Rhumb line
A line on the surface of the Earth cutting all meridians at the same angle. A rhumb line shows true direction. Parallels and meridians, which also maintain constant true directions, may be considered special cases of the rhumb line. A rhumb line is a straight line on a Mercator projection. A straight rhumb line does not show the shortest distance between points unless the points are on the Equator or on the same meridian.

RS
Remote Sensing.

Rubber sheeting
A procedure to adjust the coordinates all of the data points in a dataset to allow a more accurate match between known locations and a few data points within the dataset. Rubber sheeting, also known as rubber banding, preserves the interconnectivity or topology, between points and objects through stretching, shrinking or re-orienting their interconnecting lines.

S

SAIF
Spatial Archive and Interchange Format. SAIF is a Canadian Draft National Standard for Geomatics data interchange. It is a specification for data, which includes an object-oriented data model, and a language for describing both spatial and non-spatial data.

Scale
The relation between the size of an object on a map and its size in the real world.

Scanner
A device for converting images from maps or photographs of part of the real world into digital form automatically.

Schema
In MAPublisher 7 the term schema is used to define the structure and makeup of the map attributes table.

SDTS
Spatial Data Transfer Standard - a standardized format used by the USGS for transferring Earth-referenced spatial data between dissimilar computer systems that includes support for the inclusion of spatial data, attribute, georeferencing, data quality report, data dictionary, and other supporting meta-data within a single file transfer format.

SEA
Self-Extracting Archive, a file compression format for reducing the size of large files for archival or transfers.

Shapefile
The shapefile format is a public format that is the native file format for ESRI ArcView product. This format can be used to export data with attributes from both ArcInfo and ArcView. From ArcInfo, the command at the ARC level to create a shape file is arcshape

Sliver
A gap formed when two lines, which should be contiguous, are slightly separated in a graphical representation or map.

Spaghetti data
Vector data composed of line segments which are not topologically structured or organized into objects and which may not even be geometrically clean. Spaghetti data can be useful however, if all that is required is a visual image or plot of a map and no spatial analysis is to be performed.

Spatial
Of space, a two or three-dimensional position in space.

Spatial data
Any information about the location and shape of, and relationships among, geographic features. This includes remotely sensed data as well as map data.

Sphere coordinates
X,Y locations on the ellipsoidal Earth, usually expressed in degrees and minutes.

Spheroid
An ellipsoid of rotation that is flattened at the poles, like the Earth.

Spline
A function in MAPublisher that improves the smoothness of curved lines, drops redundant points from paths and changes the anchor points on paths to direction points for further manual modifications.

SPOT
An Earth resource satellite with high-resolution sensors launched by France in January 1986.

Static graphic files
Unchanging and uneditable graphic files.

T

Thematic Map
A map displaying selected kinds of information relating to specific themes, such as soil, land-use etc.

Theme
A user-defined perspective on a geographic dataset specified, if applicable, by a name and feature class or dataset name, attributes of interest, or data classification scheme.

Thiessen Polygon
A polygon bounding the region closer to a point than to any adjacent point. The polygons are drawn so that the lines are of equal distance between two adjacent points. Thiessen polygons, also known as Voronoi diagrams and Dirichlet tessellations, are sometimes used as a crude form of interpolation, particularly within the geosciences.

Thinning
Reducing the number of points defining a line while preserving the essential shape of the line. Common weeding algorithms include: distance traversed algorithm, Nth point selection algorithm, angle selection algorithm, William point relaxation algorithm and Douglas-Peucker algorithm.

TIFF
Tagged Image File Format, a common raster graphic file format.

Tile
A discrete part of the Earth's surface. By splitting a study area into tiles, considerable savings in access times and improvements in system performance can be achieved.

Topographic map
A map showing natural and man-made features as well as relief, often in the form of contours.

Topography
The study of the relief of a given area on the Earth's surface, usually on a large scale, including both natural and man-made features.

Topology
The way in which geographic features relate to each other. Spatial relationships among features, including adjacency and connectivity. Relative position, as opposed to absolute position specified by coordinates, angles, and distances.

Toponym
The place names of a region or map feature.

Transform
The process of changing the scale, projection, or orientation of a mapped image.

TRIM
A GIS data file format from the Terrain Resource Information Management of British Columbia, Canada.

U

Ungenerate
The file format created by the ArcInfo Ungenerate function.

UNIX
A general-purpose, multi-user computer operating system.

URL
Universal Resource Locator or Internet address.

USGS
United States Geological Survey.

UTM
Universal Transverse Mercator projection.

UTM Grid
A grid system based upon the Transverse Mercator projection. The UTM grid extends North-South from 80°N to 80°S latitude and, starting at the 180° Meridian, is divided eastwards into 60, 6 degree zones with a half degree overlap with zone one beginning at 180 degrees longitude. The UTM grid is often used for topographic maps and for georeferencing satellite images.

V

Vector linework / artwork
One method of data type, used to store spatial data. Vector data is comprised of lines, defined by beginning and end points, which meet at nodes. The locations of these nodes and the topological structure are usually stored explicitly. Features are defined by their boundaries only and curved lines are represented as a series of connecting arcs. Vector storage involves the storage of explicit topology, which raises overheads, however it only stores those points which define a feature and all space outside these features is non-existent.

Vector data
An abstraction of the real world where positional data is represented in the form of coordinates. In vector data, the basic units of spatial information are points, lines and polygons. Each of these units is composed simply as a series of one or more coordinate points. A line is a collection of related points and a polygon is a collection of related lines.

Vertex
One of a set of ordered X,Y coordinates that constitute a line. A points representing spatial X,Y coordinates that occur along a line between the nodes and help define the shape of the arc.

VPF
Vector Product Format. A binary format used by the US Defense Mapping Agency. It is well documented and can be sued as an internal format and as a transfer format. It carries geographic and attribute information but no display data. VPF files are sometimes referred to as VMAP products. MAPublisher does not support VPF files.

W

World file
A file associated with an image that contains georeferencing information for the image. File extensions may be TFW or JPW (tiff, jpeg World Files), IRP (Image Report Files) or TAB (Table files).

WWW
World Wide Web.

Z

Zone
Any well-defined region of more or less belt-like form.

Zoom
To magnify or reduce the current view of a document.